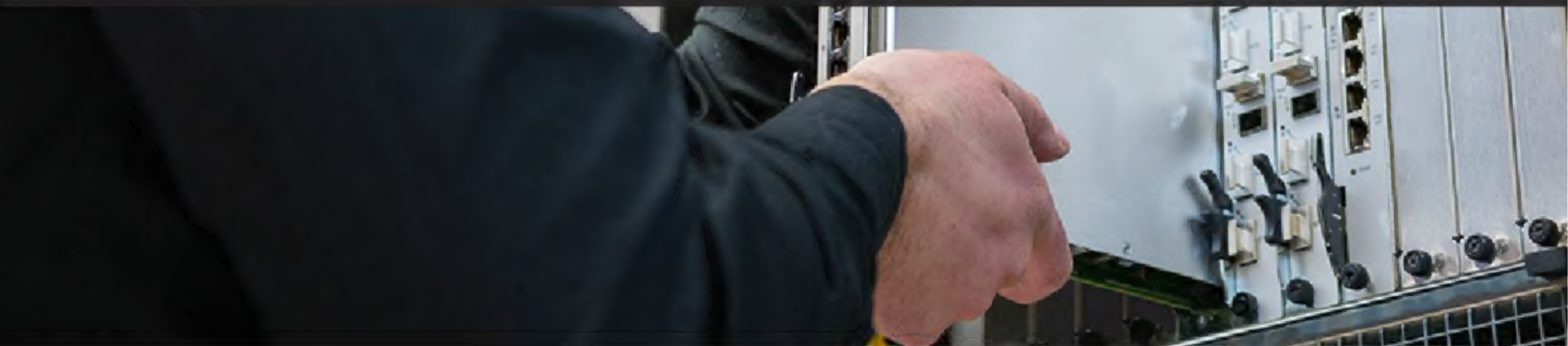




# MCSE

Microsoft Certified  
Solutions Expert



Lab Manual





**Windows Server 2012**

**MCSE**

(Microsoft Certified Solutions Expert)

**Server Infrastructure**

**Lab Manual**



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# Introduction

This lab manual has been designed as a comprehensive reference manual for Windows server 2012 configuration. This is a supplement to the MCSE (Server Infrastructure) course taught by Zoom Technologies.

All five modules of the MCSE certification course have been covered. We have taken great care to ensure that each configuration exercise is clearly and lucidly explained to the student, so that it is easy for the student to perform that task. Screenshots have been used extensively, for every step in the configuration.

This lab manual will lead the student from the basics of Windows Server 2012 installation, Active Directory configuration, right up to hosting secure websites on IIS and the related DNS configuration. Other network services like DHCP, FTP, etc. have also been included to give the student a complete administration manual which would be useful not only during the training, but also in the daily course of a system administrator's job.

We have divided each exercise into the followings sections for ease of understanding:

1. Objective
2. Topology
3. Pre-requisites
4. Configuration
5. Verification.

A lot of effort has gone into the production of this lab manual, which we hope will benefit the serious student. We welcome feedback and suggestions from all users of this manual, so that it can be further improved.



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## Lab – 1: Installing Windows Server 2012 Operating System

**Objective:**

To Install Windows Sever 2012 Operating System in a Computer.

**Pre-requisites:**

Before working on this lab, you must have

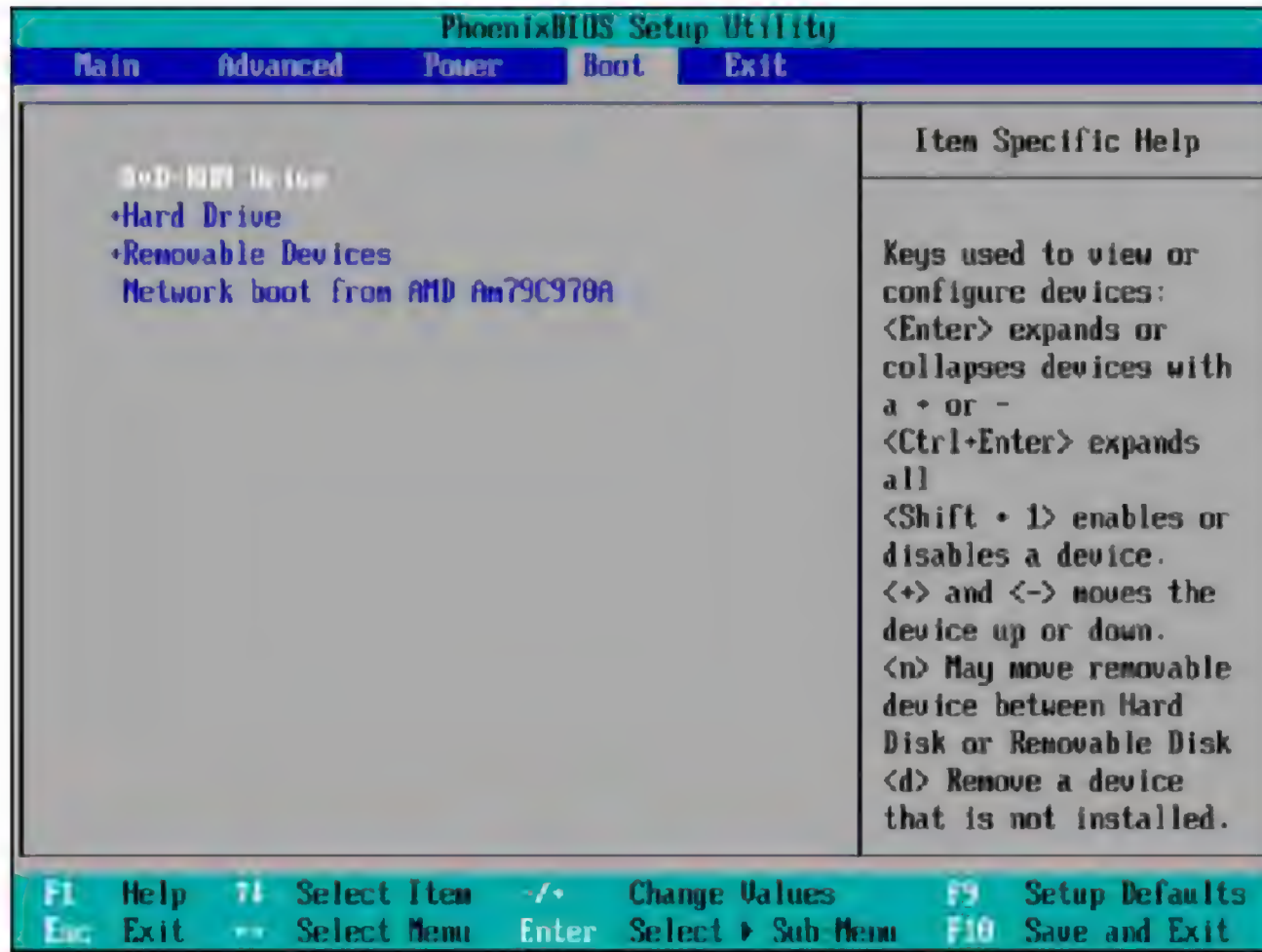
- A Computer and Windows Server 2012 Operating System DVD.





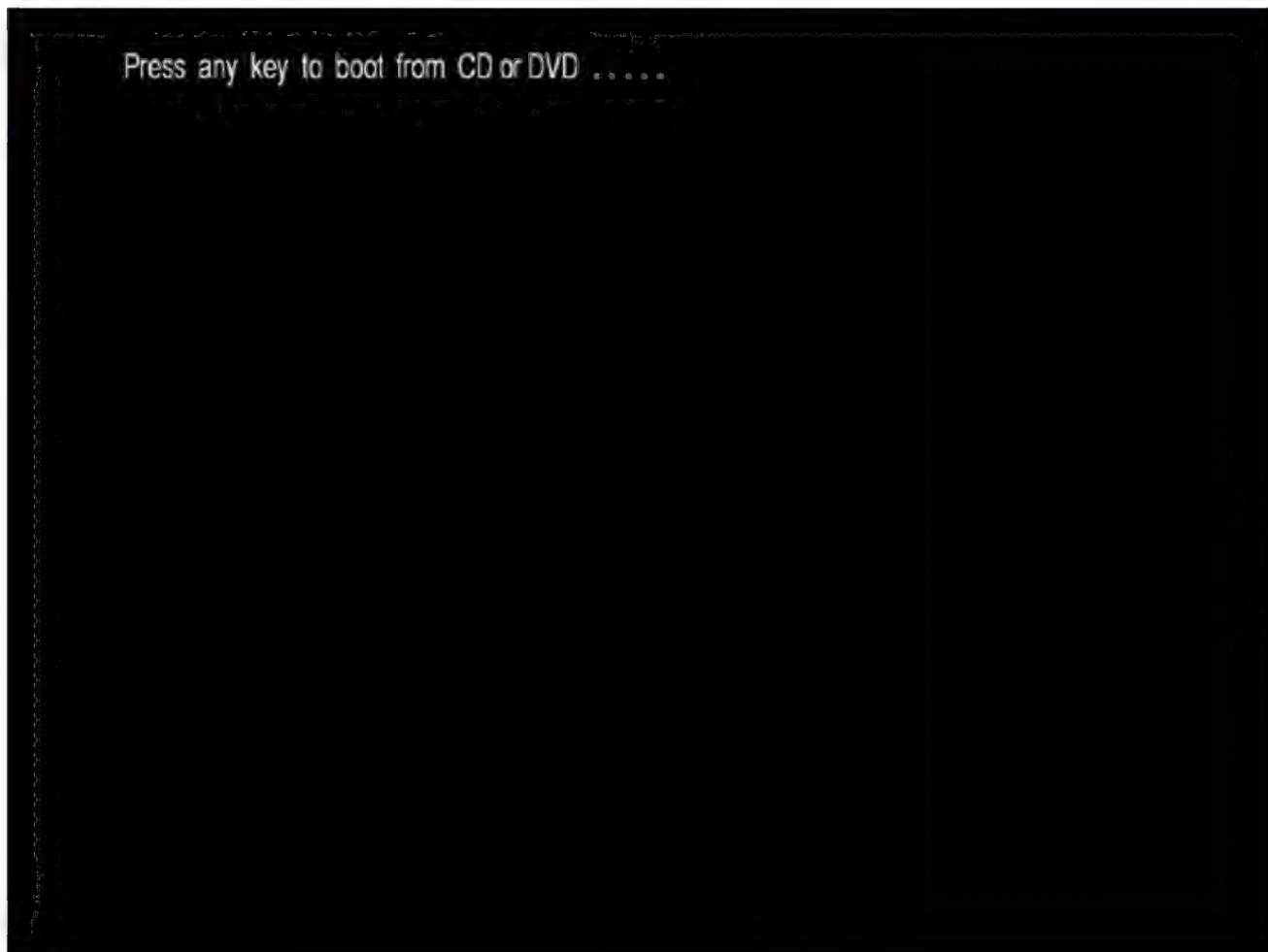
**Steps:**

1. Restart the System and go to **BIOS**.
2. Set the First Boot Device as **DVD ROM**.

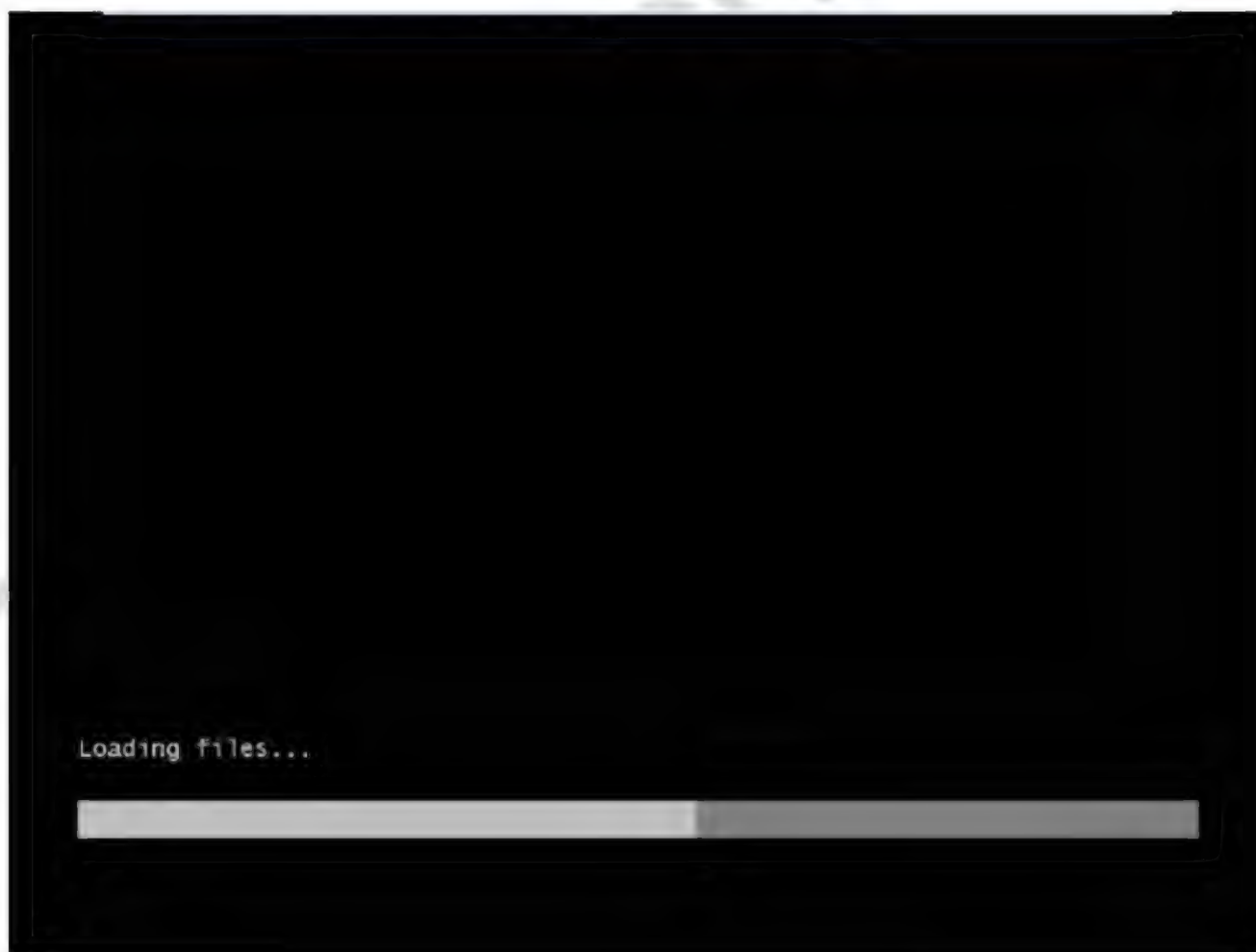


3. Save the settings by Pressing **F10** and click **YES**.
4. Insert **Windows Server 2012 DVD** and Restart the system.

5. Press any key to boot from the CD or DVD.



6. System copies the files from DVD.



7. Select the language to install **English**.

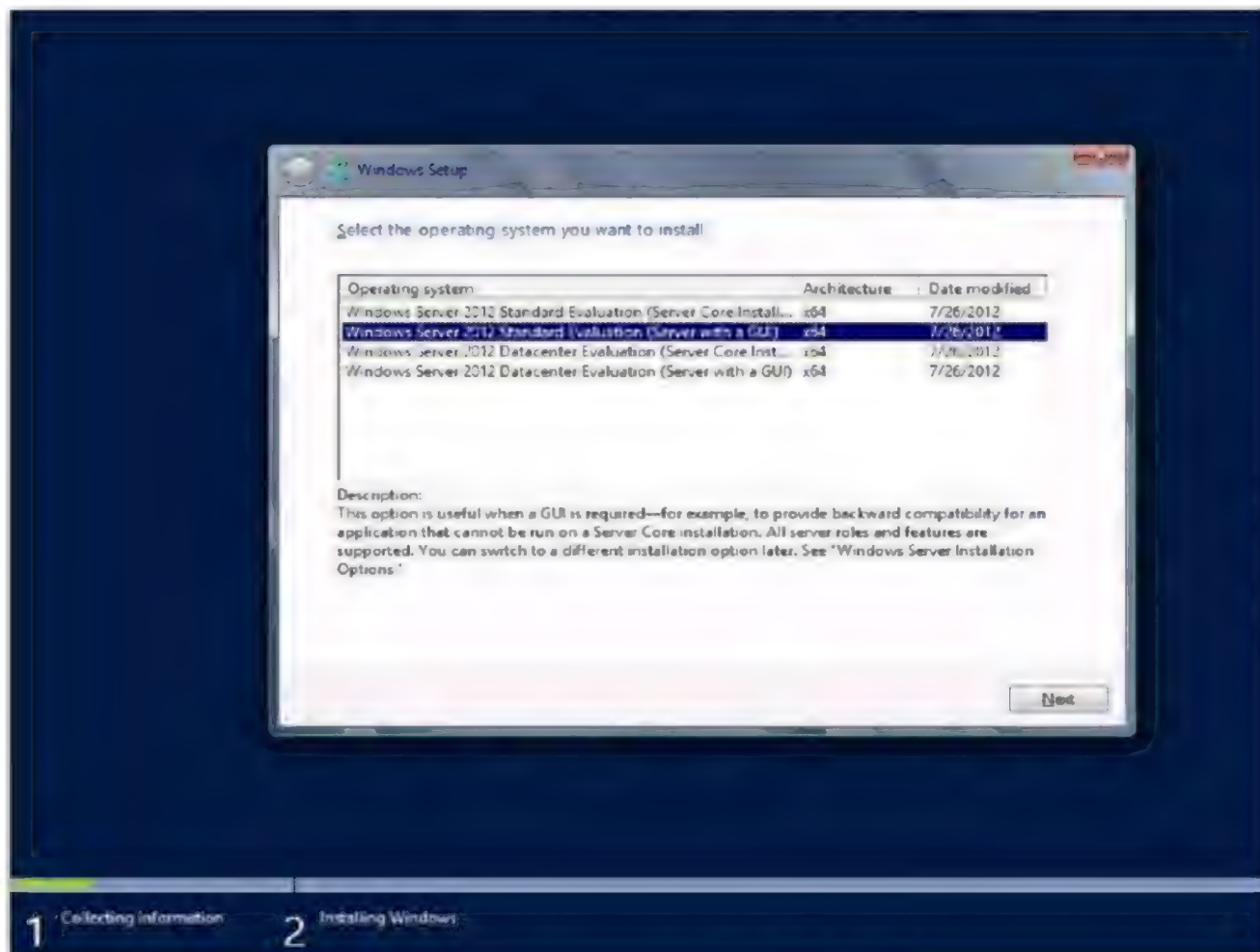


8. Click **Install now**.

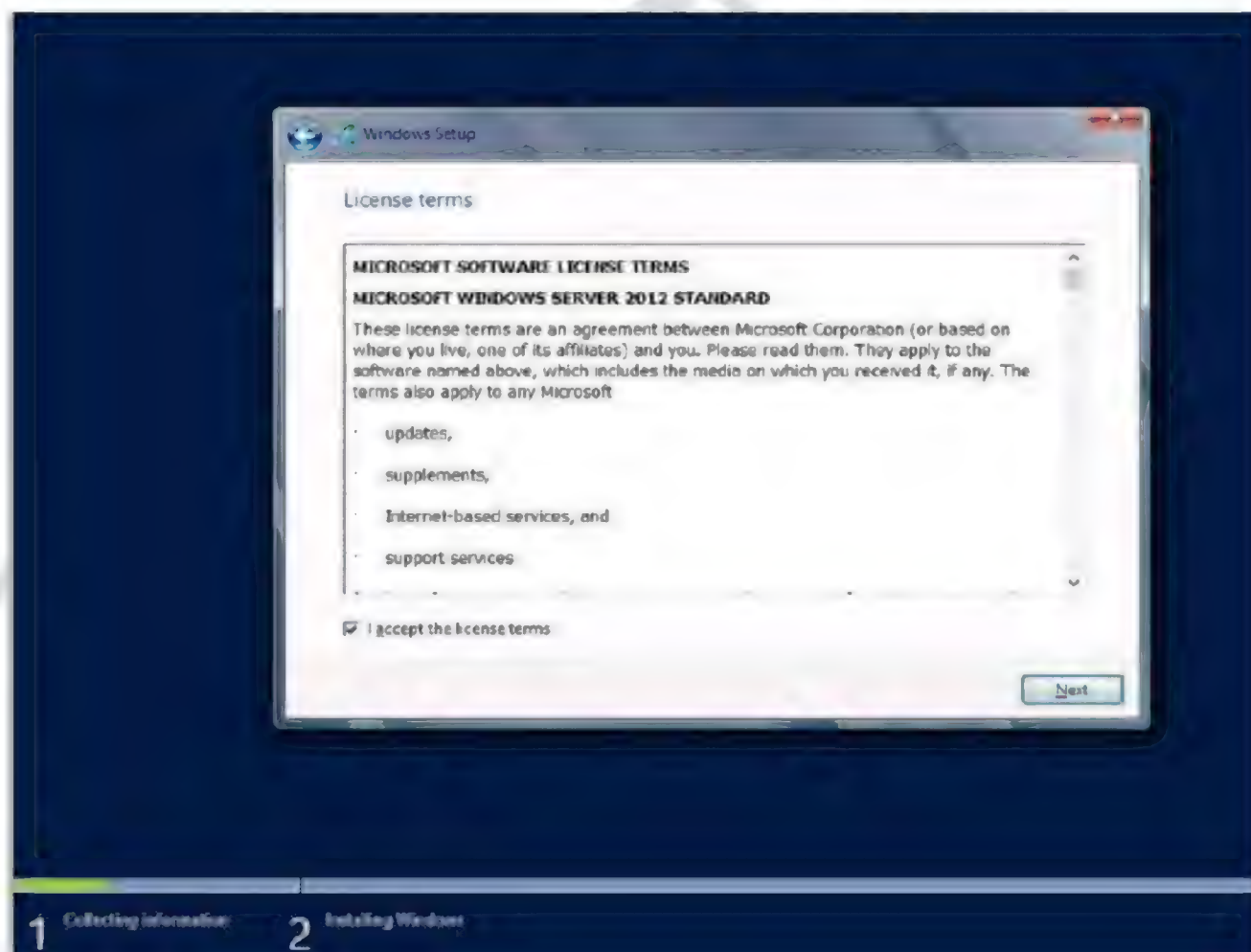




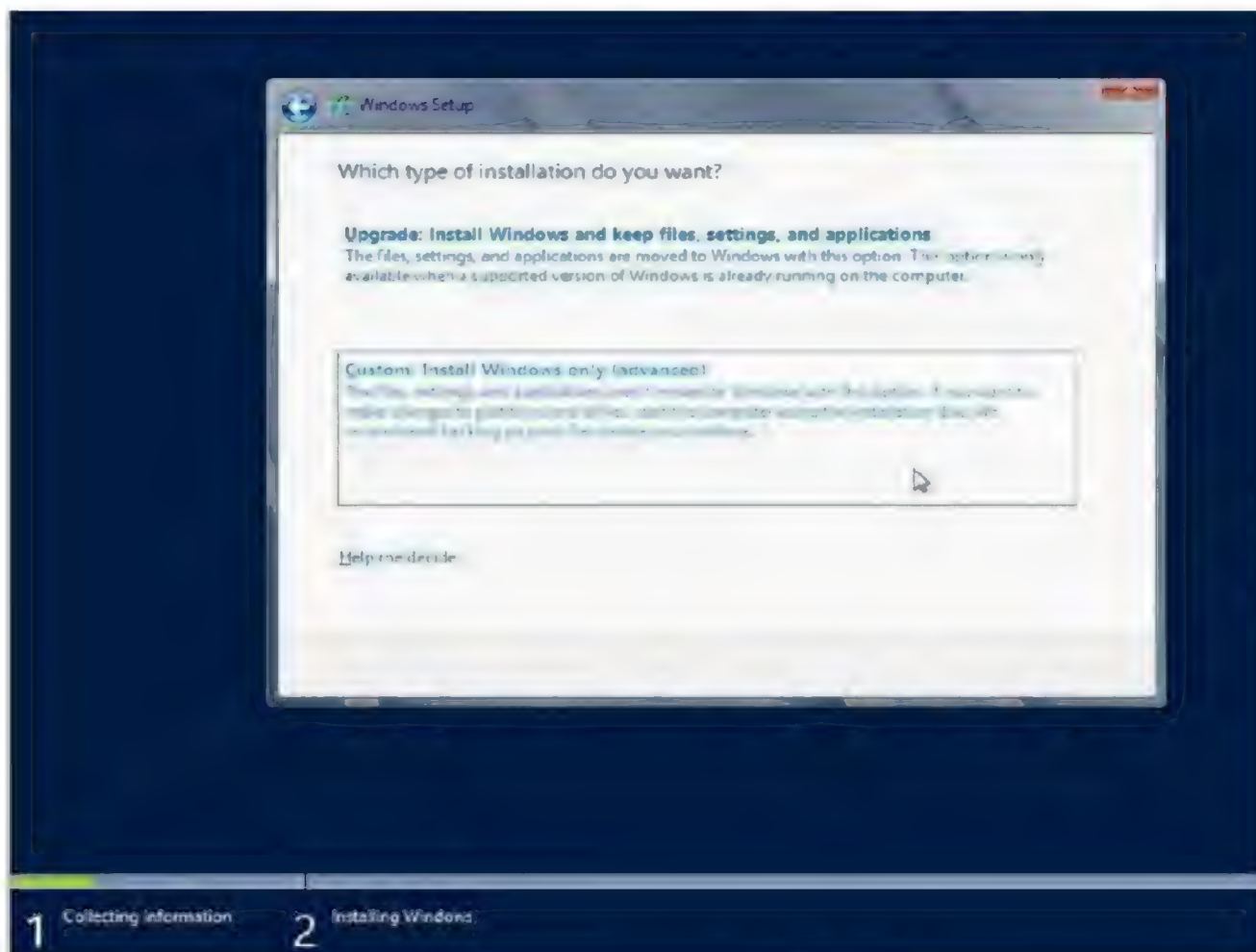
9. Select the edition **Windows Server 2012 Standard (Server with a GUI)**, click **Next**.



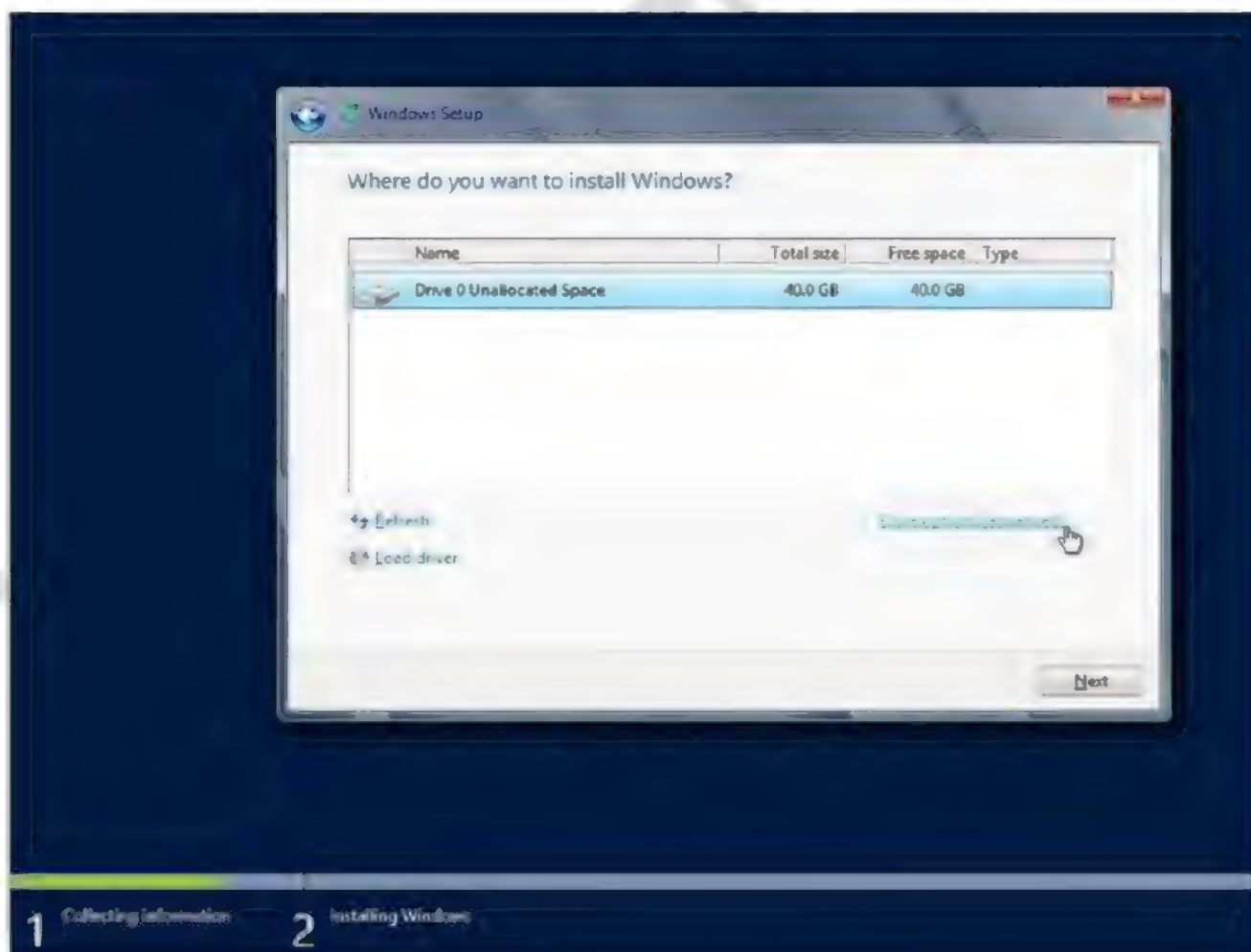
10. Check the box **I accept the license terms** and click **Next**.



11. Select **Custom Installation**.

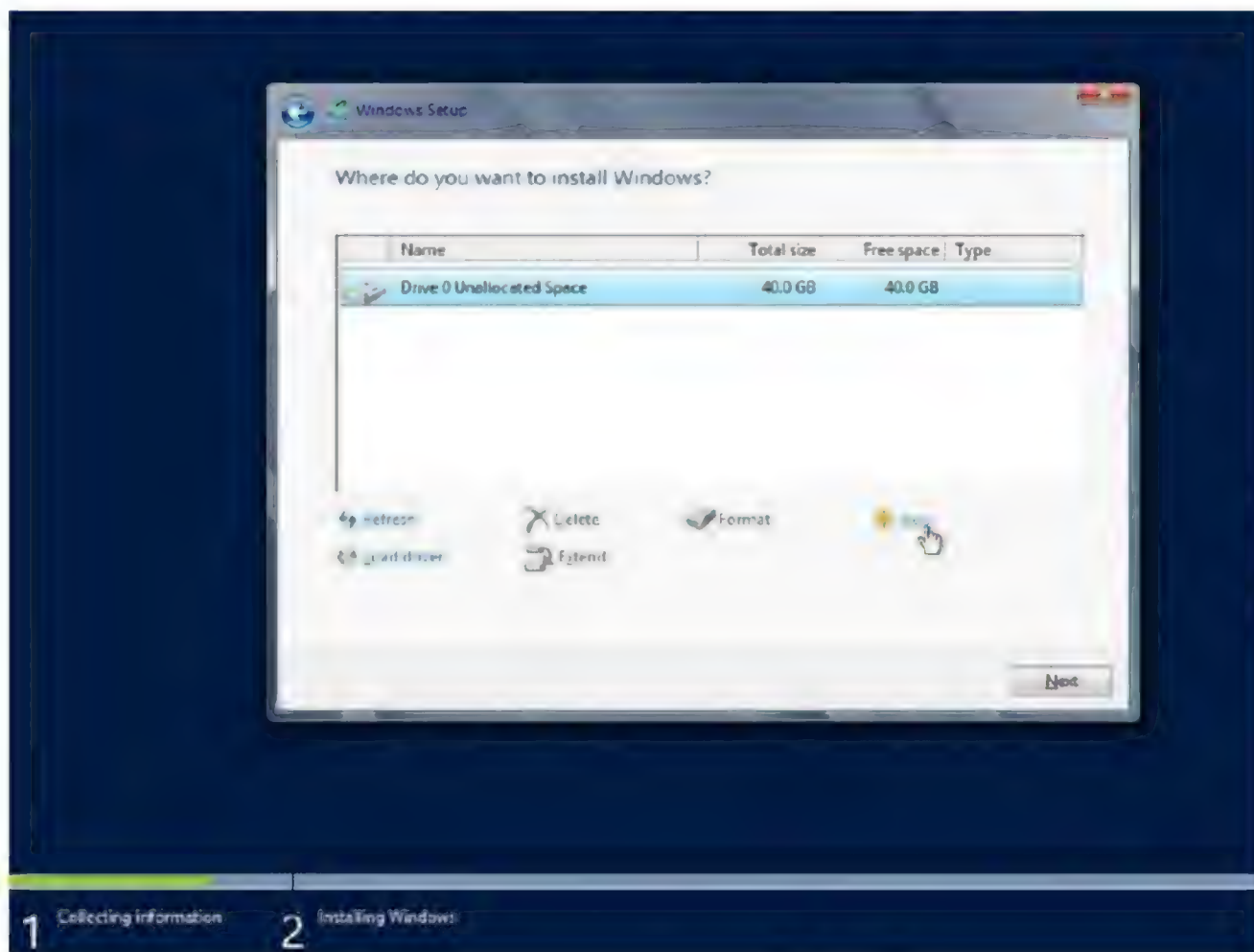


12. Click **Drive options**.

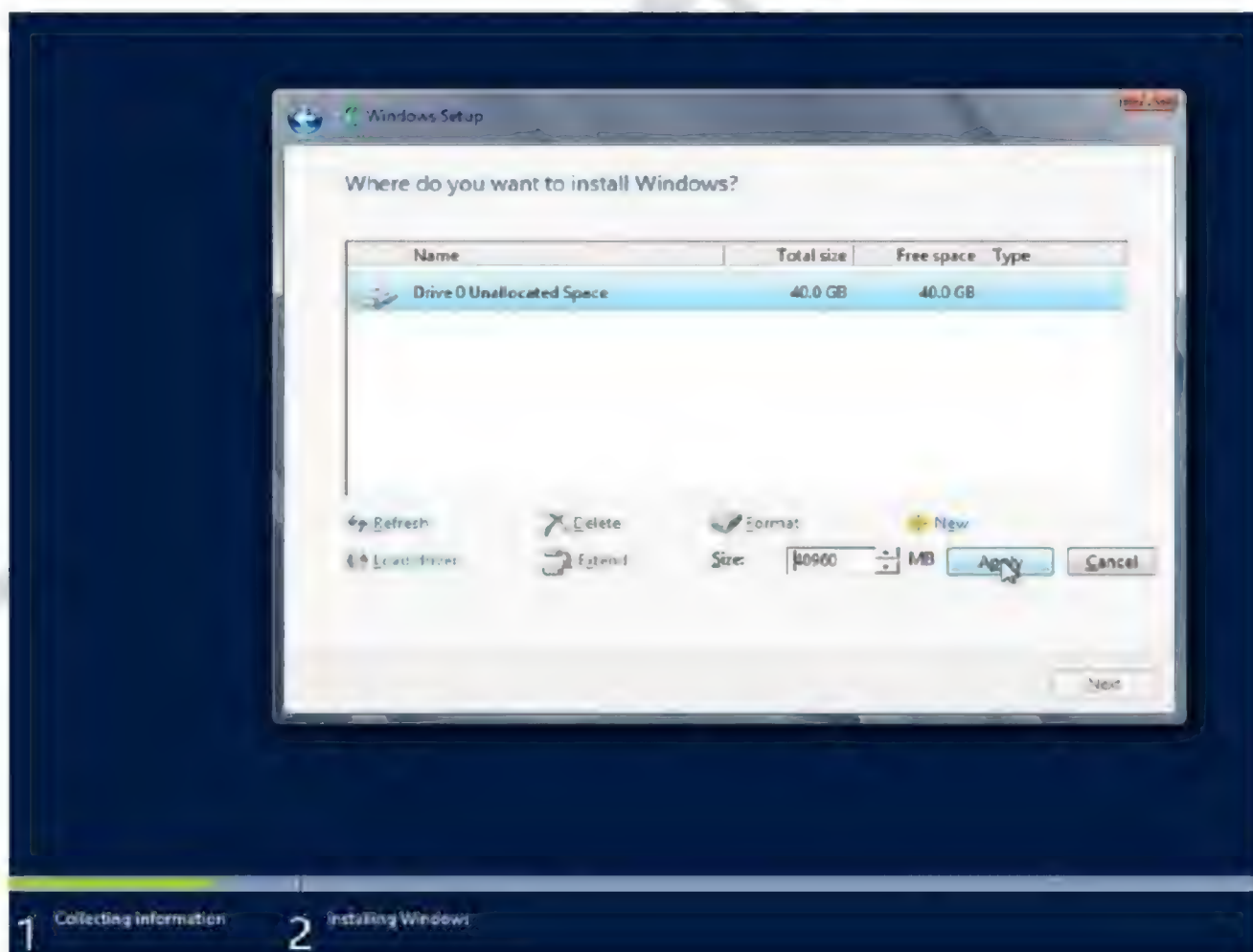




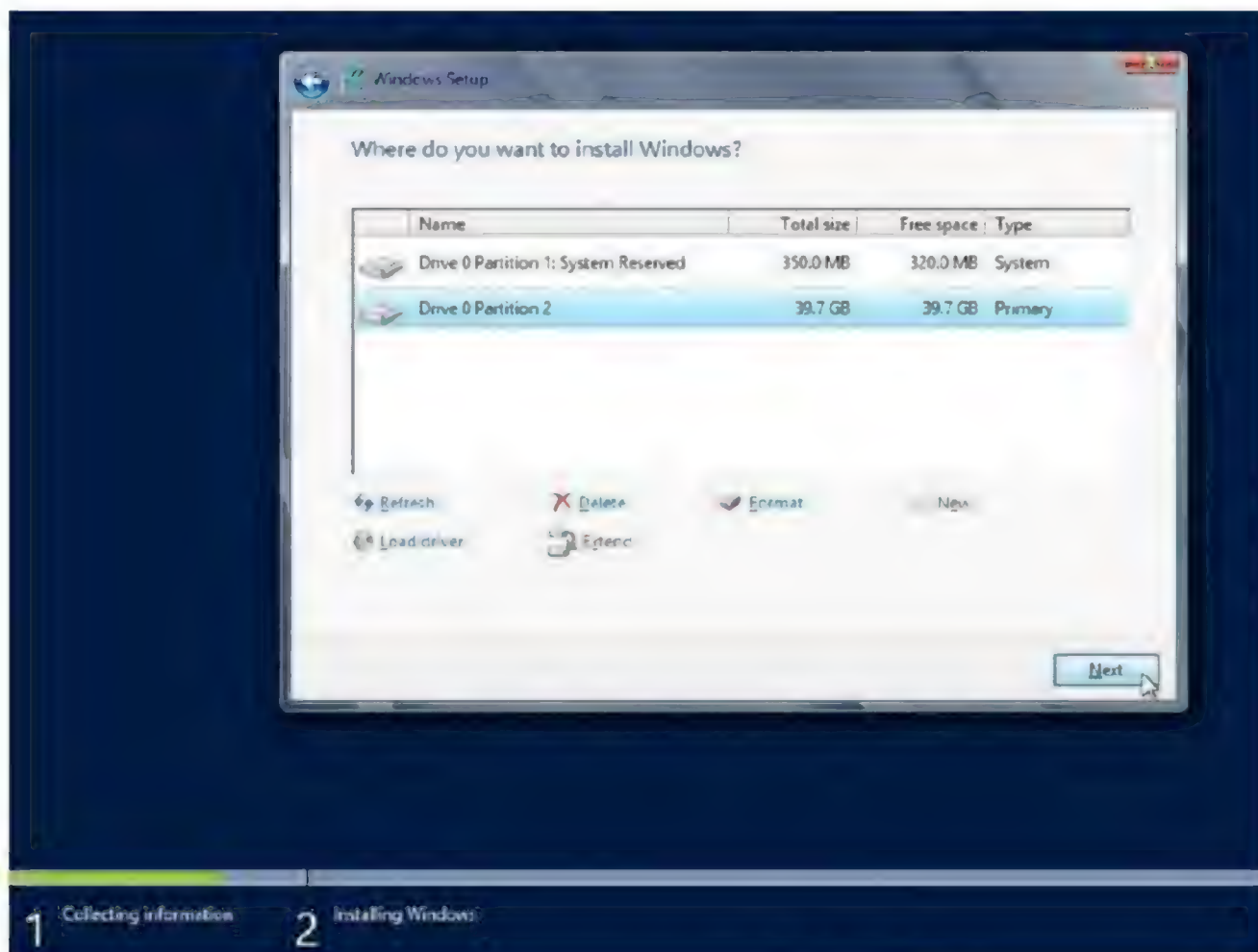
13. Select Unallocated Space and click **New**.



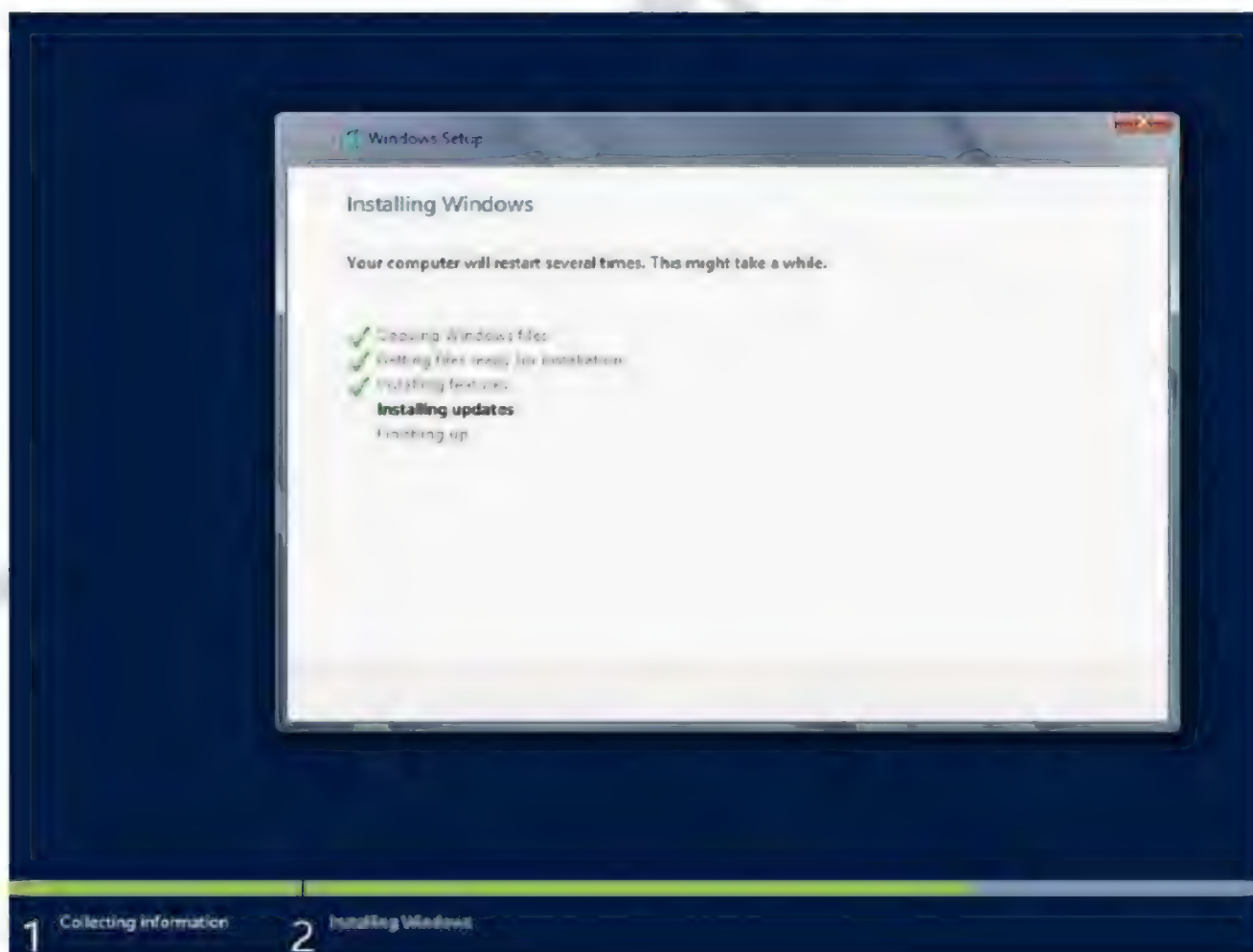
14. Enter the size for the partition, and click **Apply**.



15. Select the **Partition** and click **Next**.

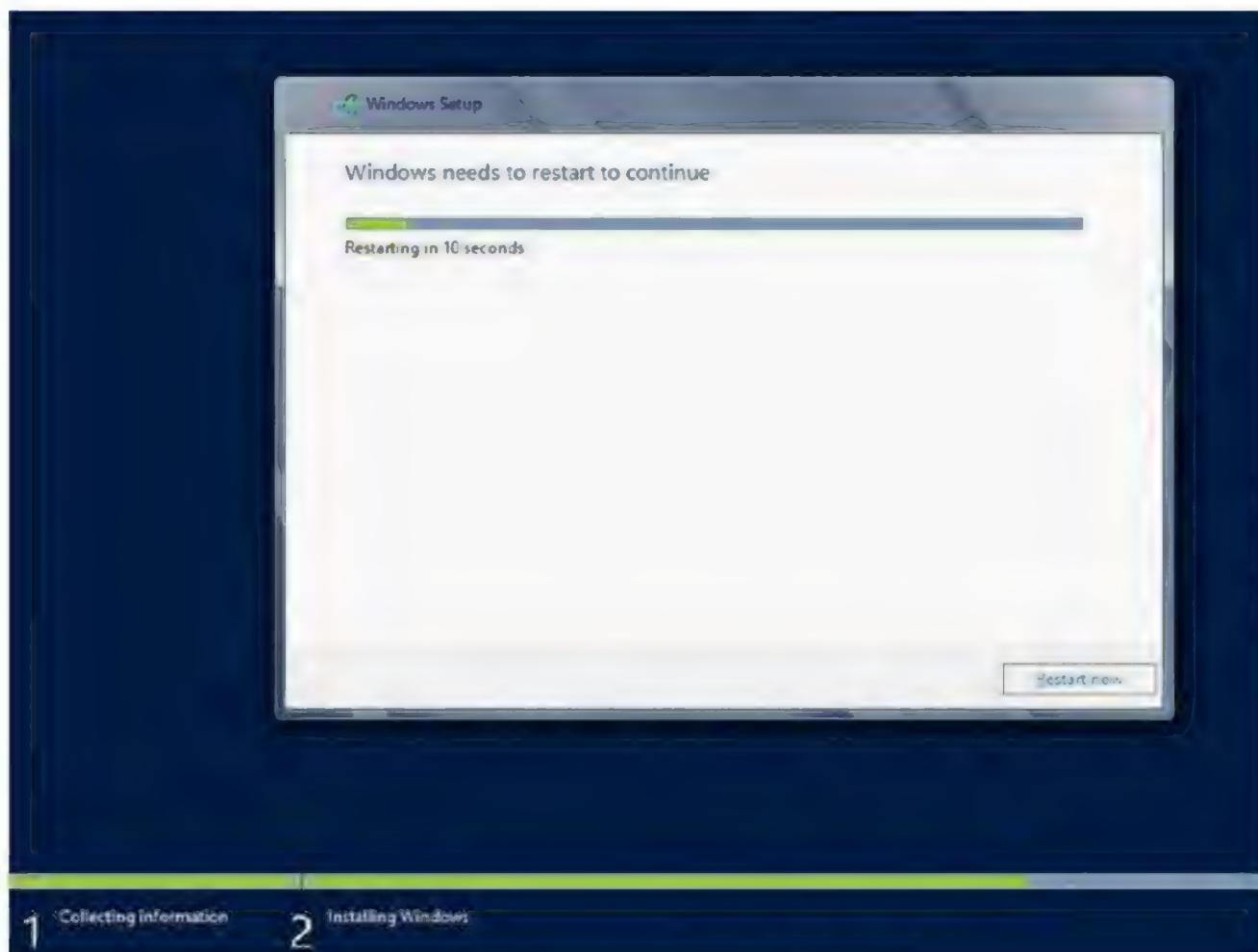


16. Windows Installation will start.





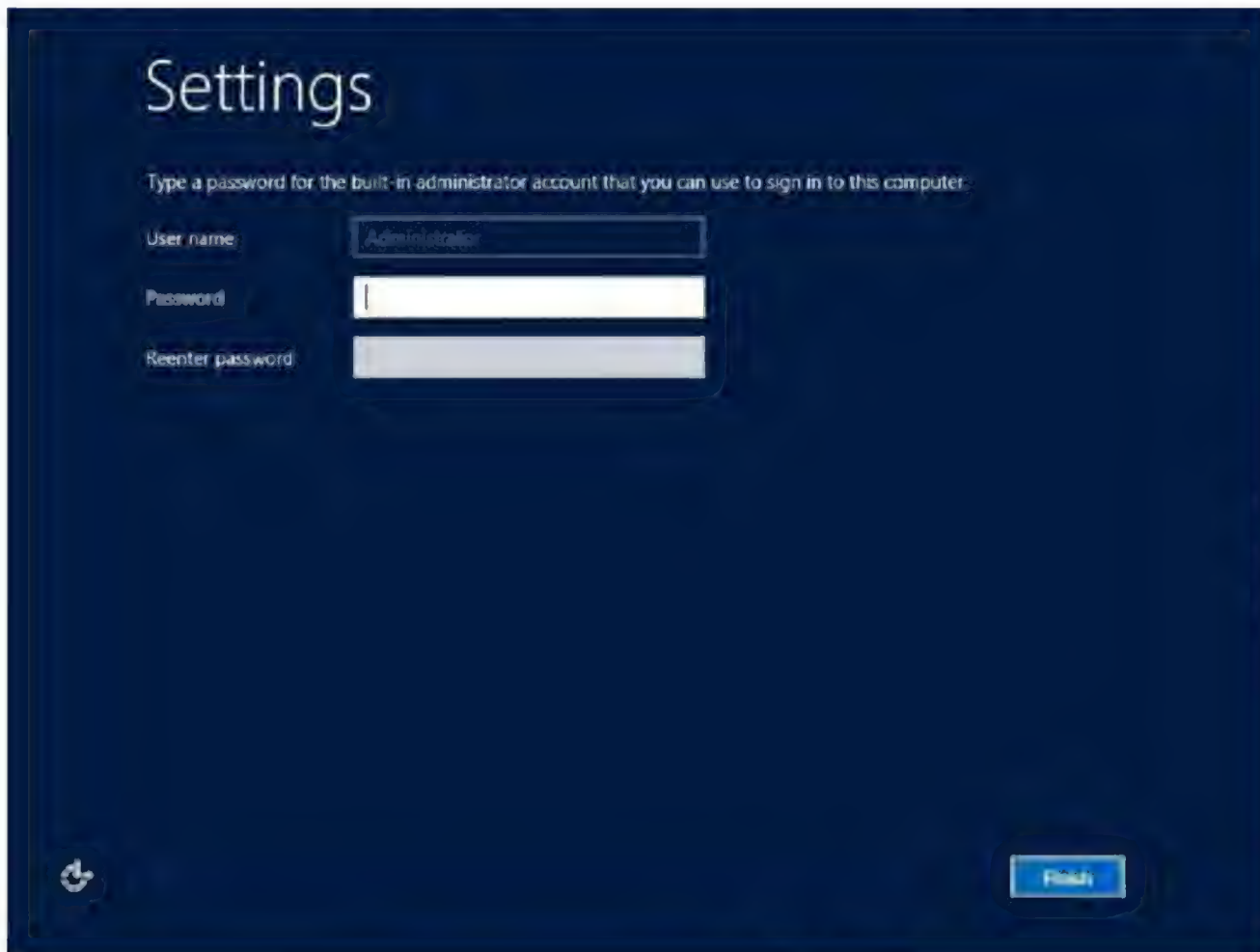
17. System Restarts.



18. Completes the Installation, and system will be restarted.



19. Enter Password and Re-enter Password for Administrator account, click **Finish**.



The image shows the Windows 'Settings' window for configuring the built-in administrator account. The title bar says 'Settings'. Below the title, it says 'Type a password for the built-in administrator account that you can use to sign in to this computer:'. There are three input fields: 'User name:' with 'Administrator' entered, 'Password:' with a single character entered, and 'Reenter password:' which is empty. A 'Finish' button is located at the bottom right. A small circular icon with a right arrow is at the bottom left.

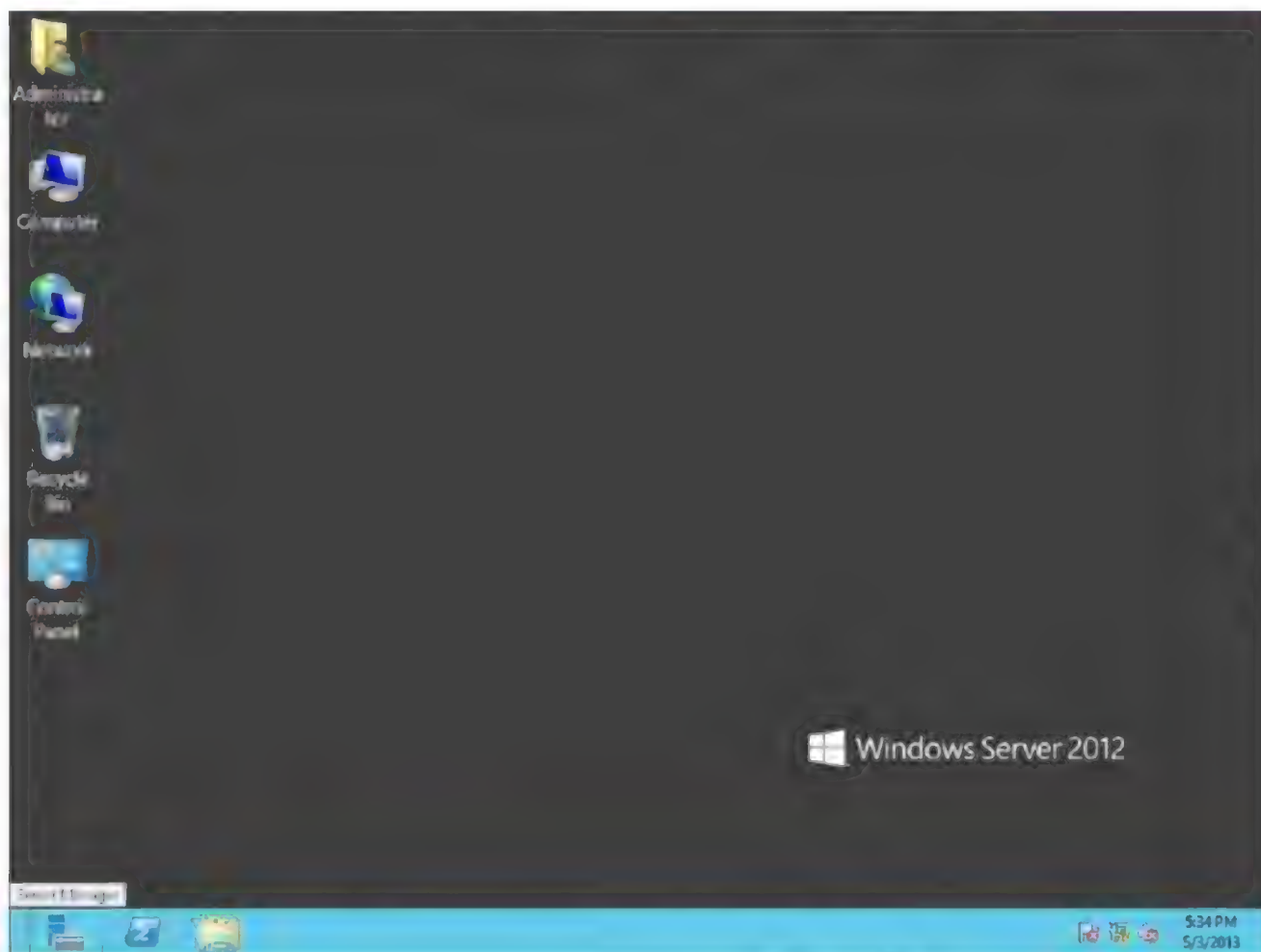
20. Enter Password and Logon using the Administrator account.



The image shows the Windows Server 2012 login screen. It features a dark blue background. On the left, there is a circular icon with a left arrow and a placeholder image of a person. To the right of the image, the text 'Administrator' is displayed above a password input field containing several dots. A small circular icon with a right arrow is at the bottom left. At the bottom center, the Windows logo is followed by the text 'Windows Server 2012'.



21. Finally Administrator has logged in.



## Lab – 2: Installing Windows client Operating System

**Objective:**

To Install Windows Client Operating System in a Computer

**Pre-requisites:**

Before working on this lab, you must have

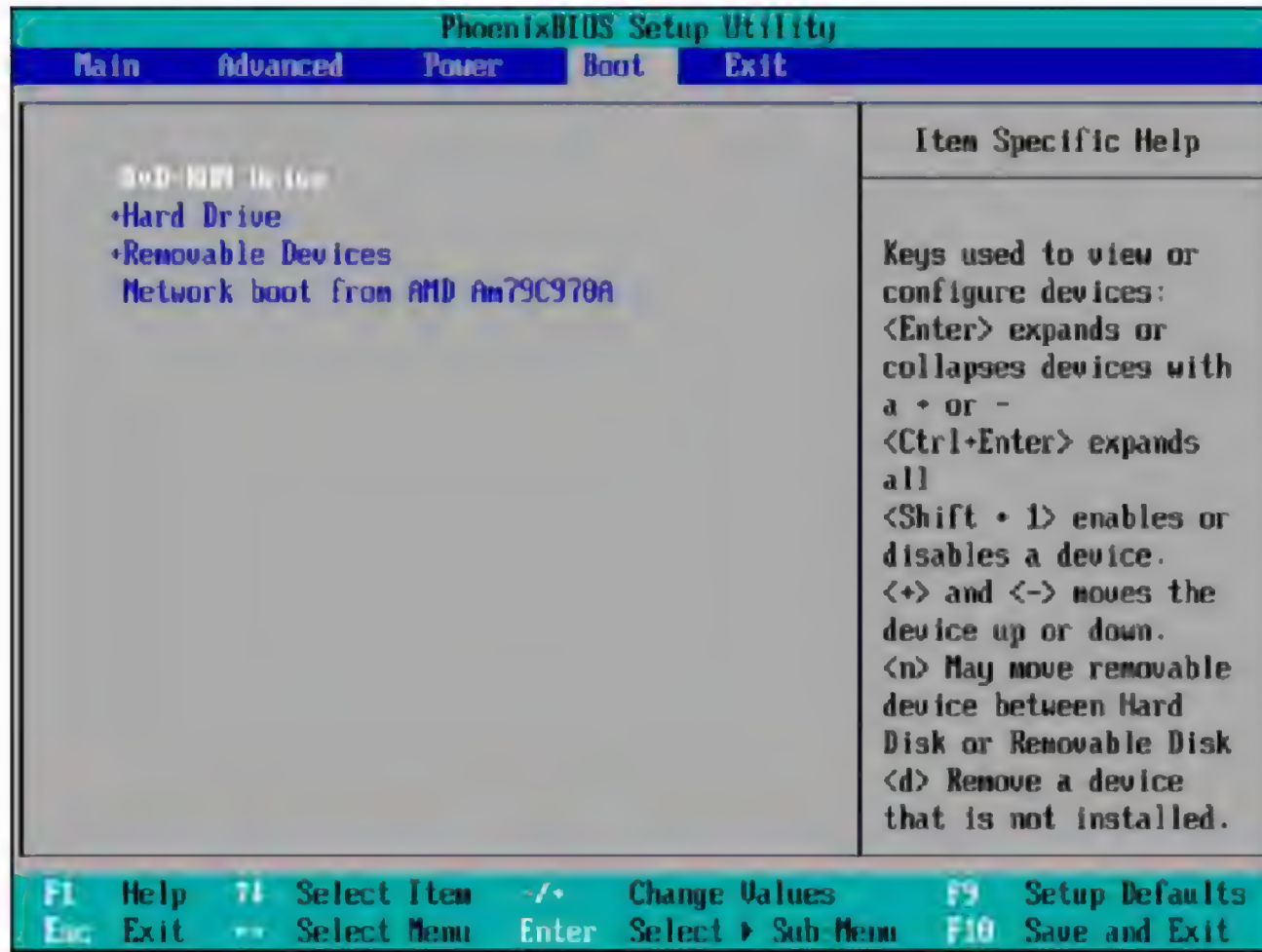
- A Computer and Windows 7 Operating System DVD.





**Steps:**

1. Restart the System and go to **BIOS**.
2. Set the First Boot Device as **DVD ROM**.



3. Save the settings by Pressing **F10** and click **YES**.
4. Insert **Windows 7DVD** and Restart the system.

5. Press any key to boot from the CD or DVD.



6. System copies the files from DVD.





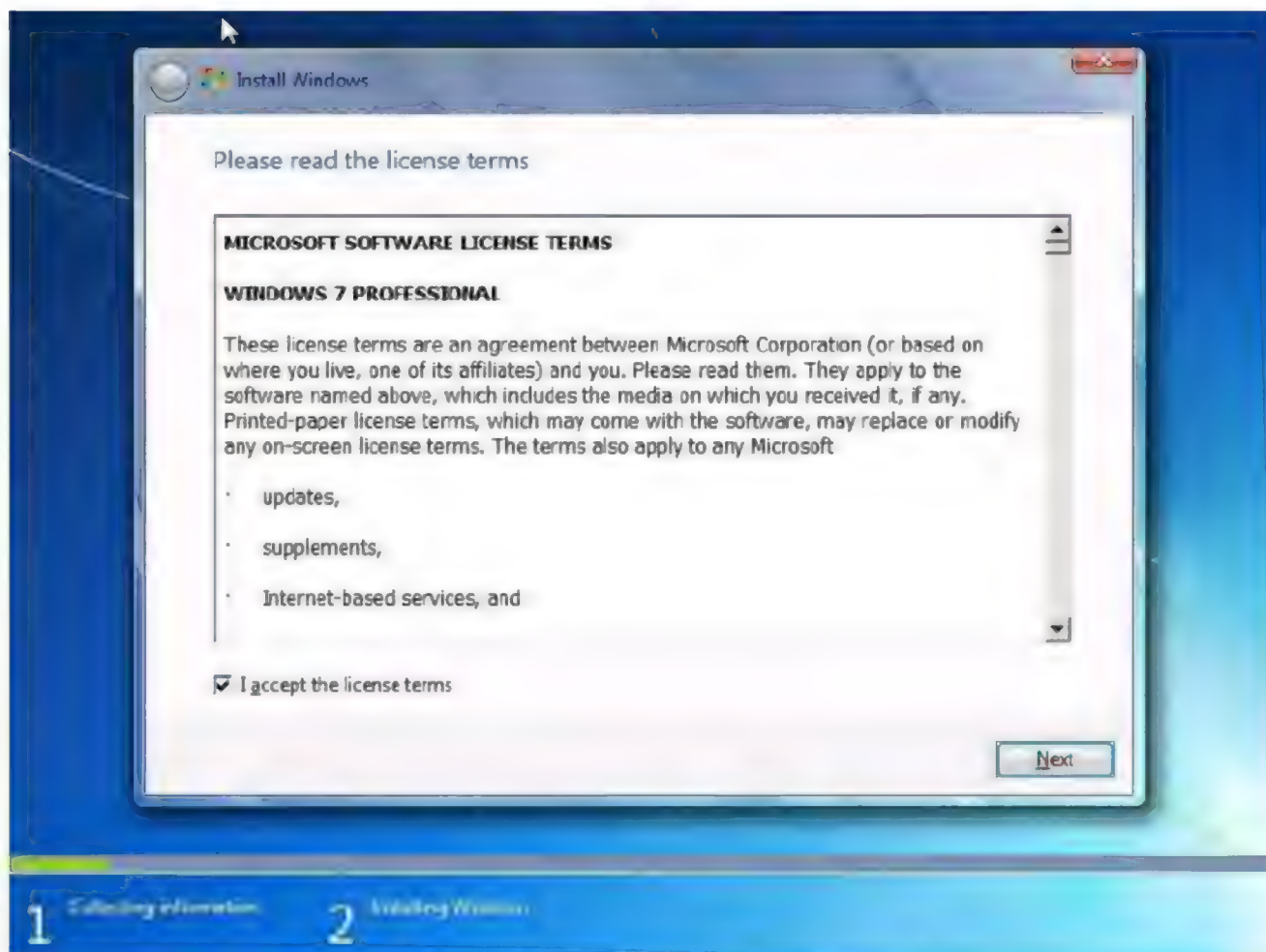
7. Select the language to install English and click **Next**.



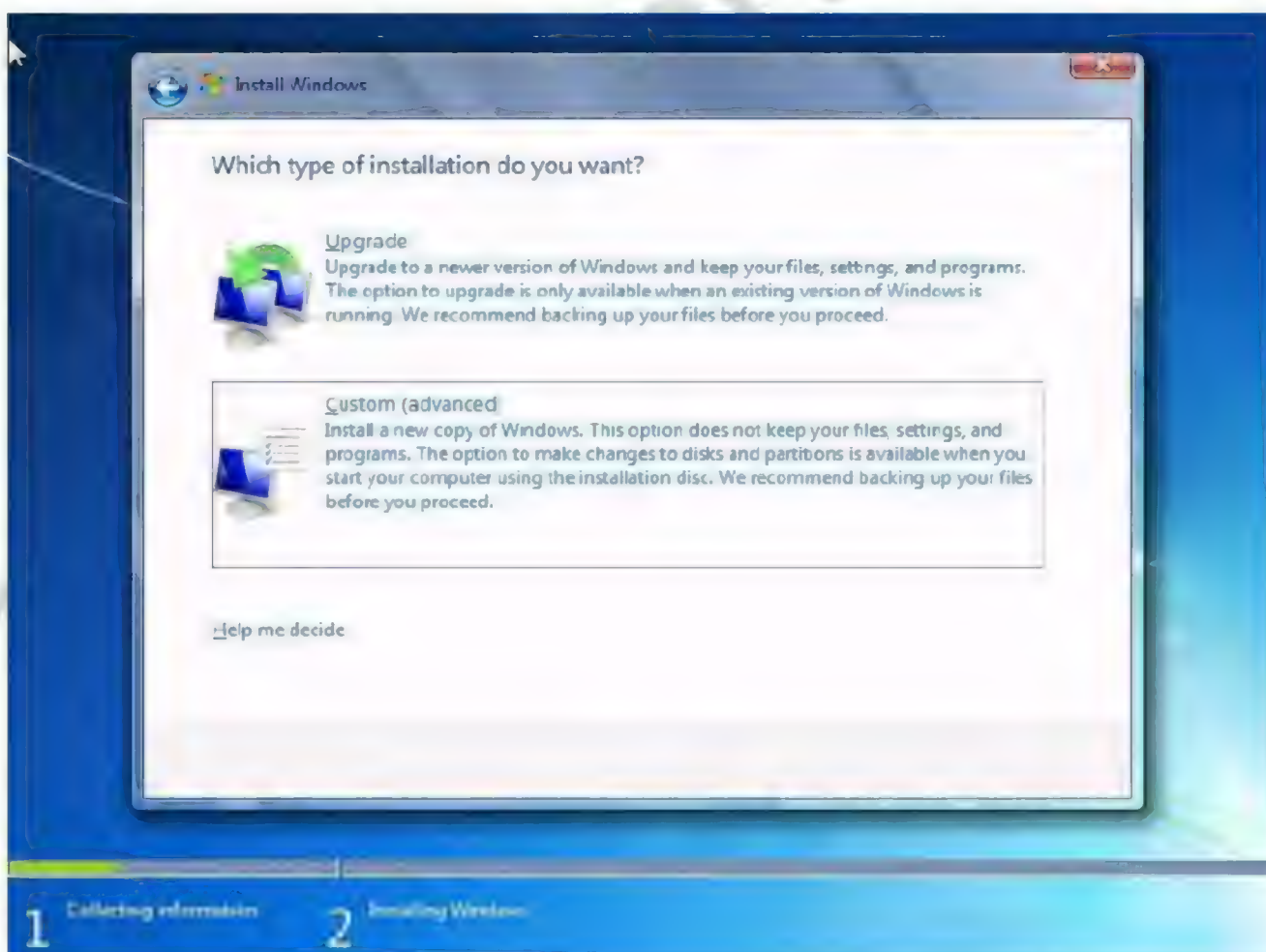
8. Click **Install now**.



9. Check the box **I accept the license terms**

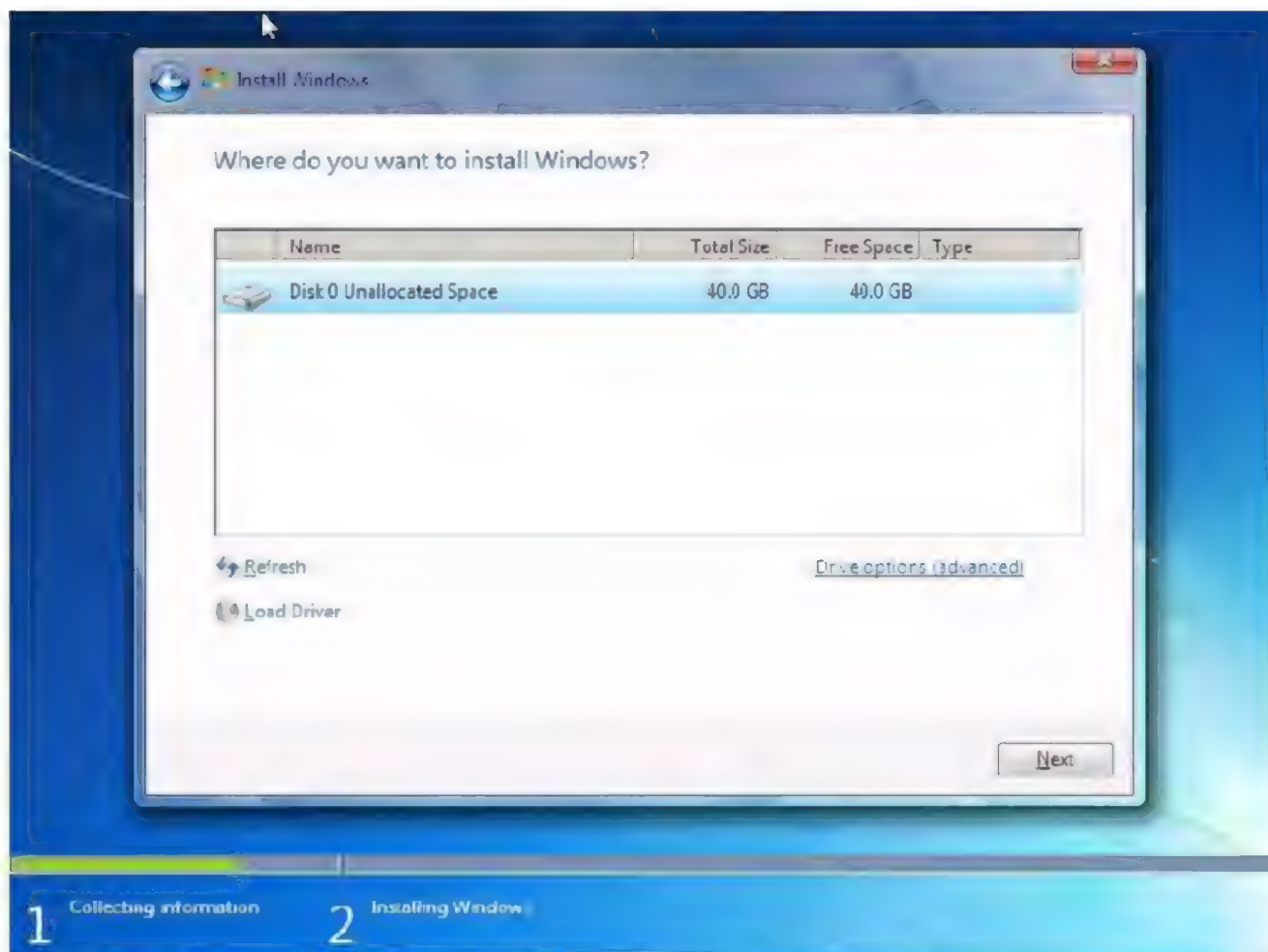


10. Select **Custom Installation**.

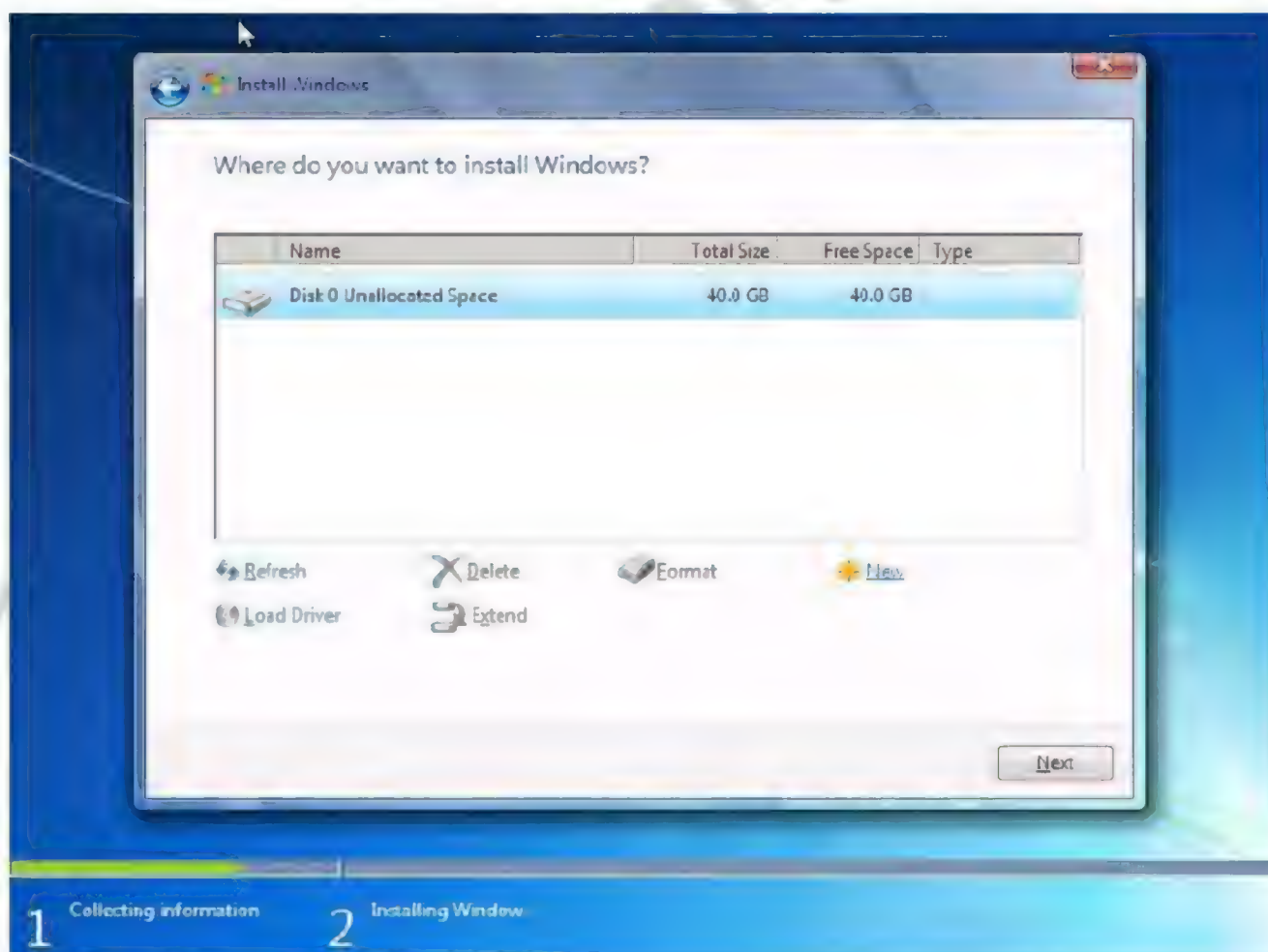




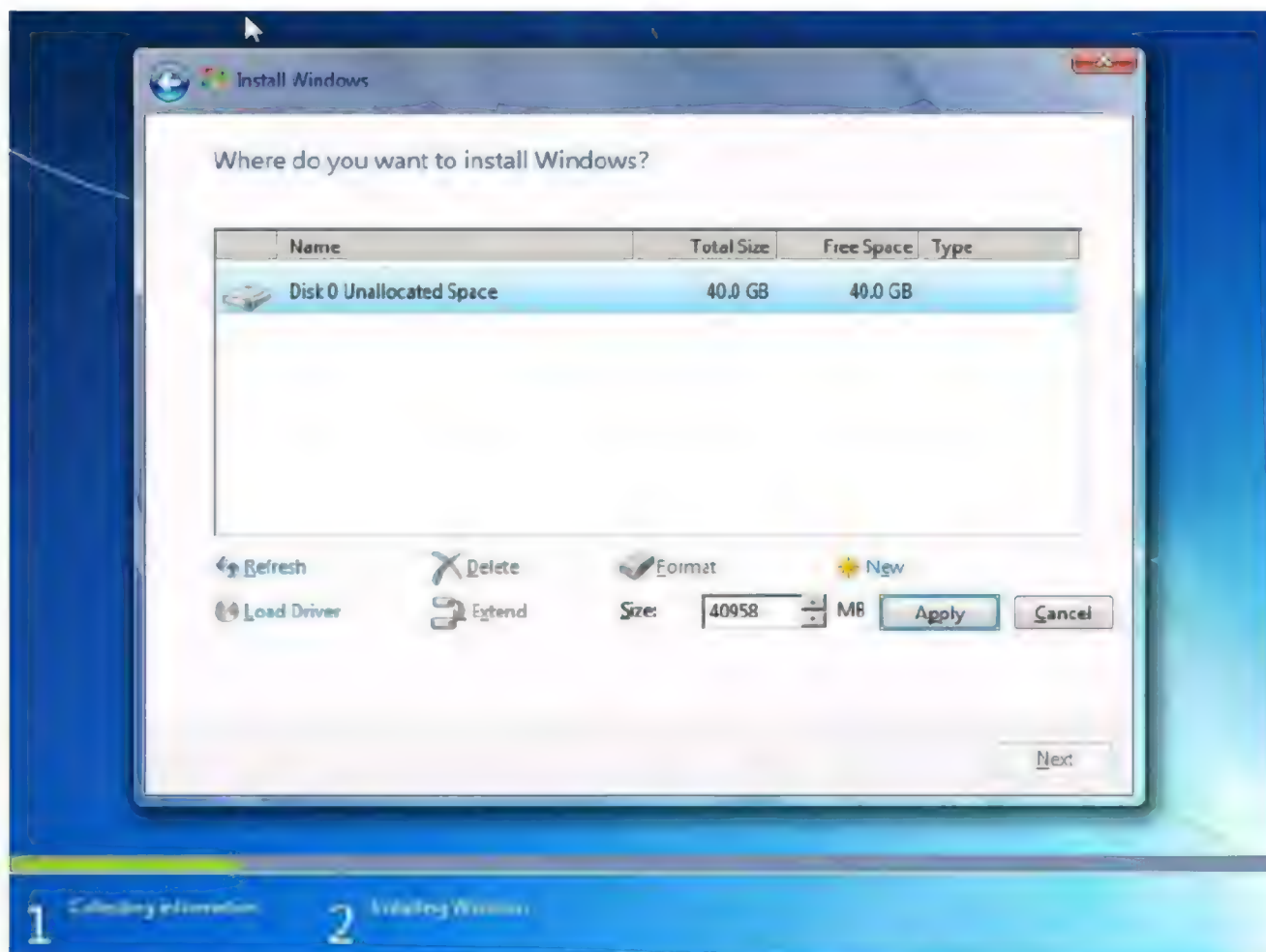
11. Click **Drive options**.



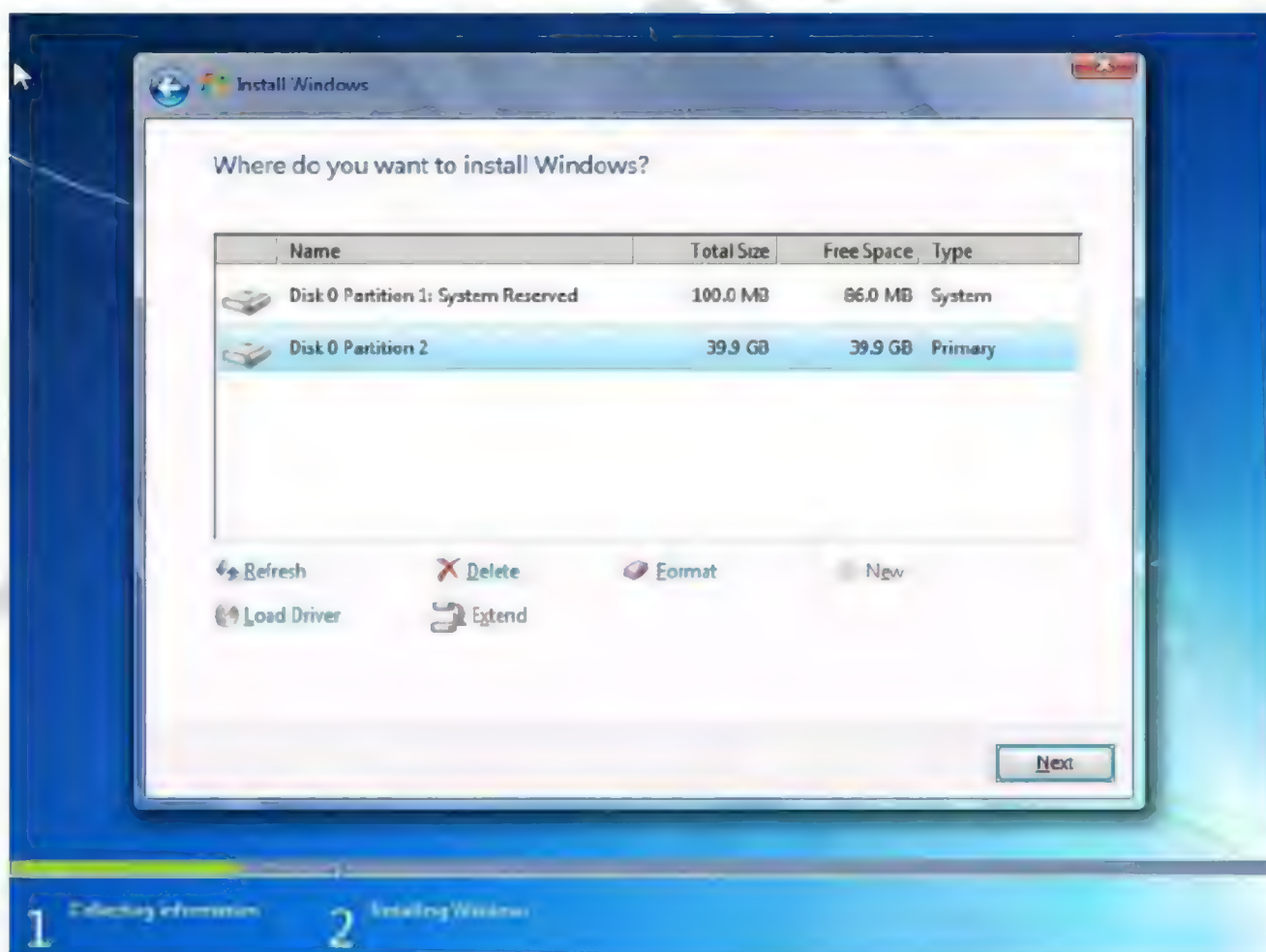
12. Select Unallocated Space and click **New**.



13. Enter the size for the partition, and click **Apply**.

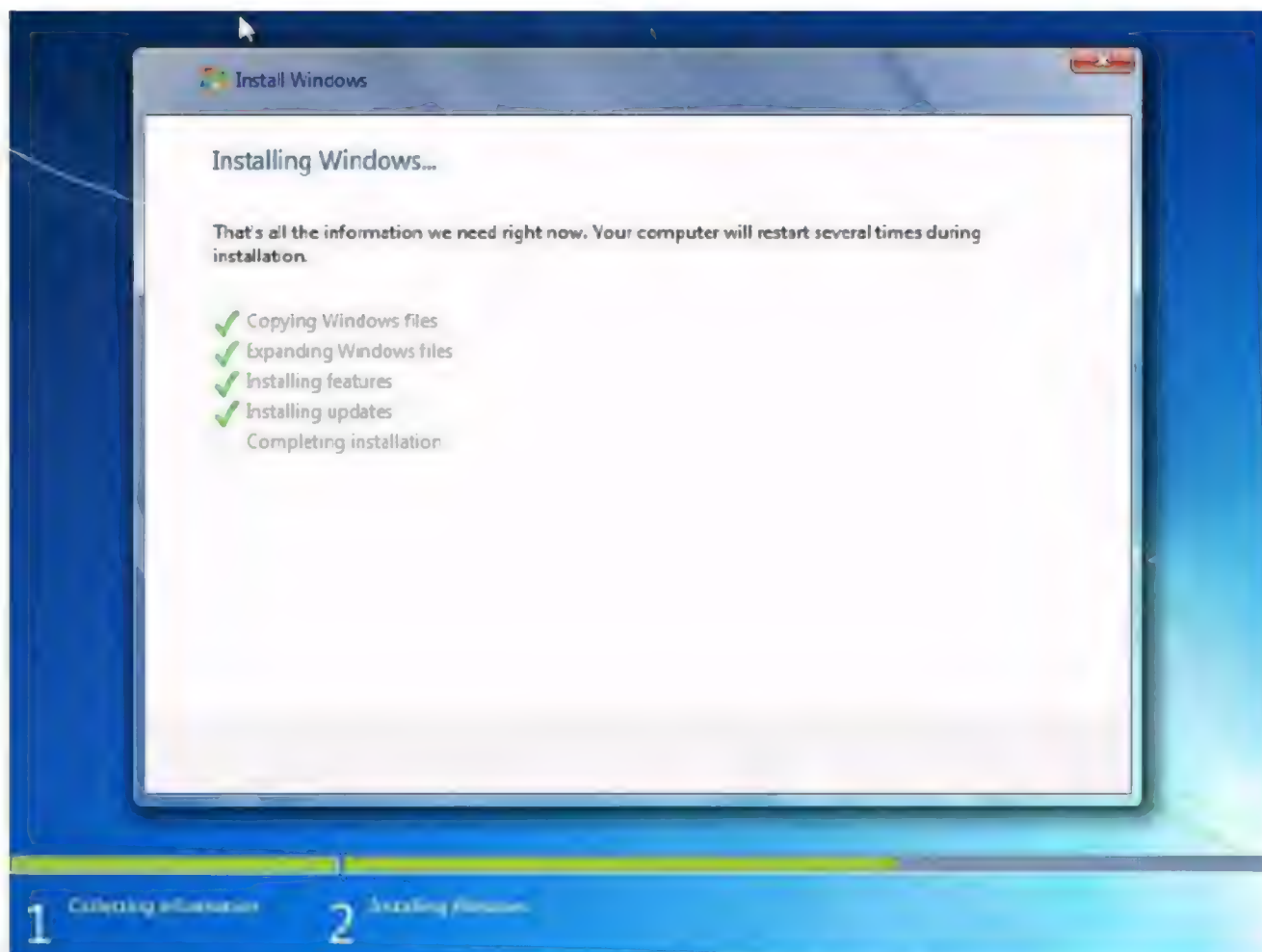


14. Select the **Partition** and click **Next**.

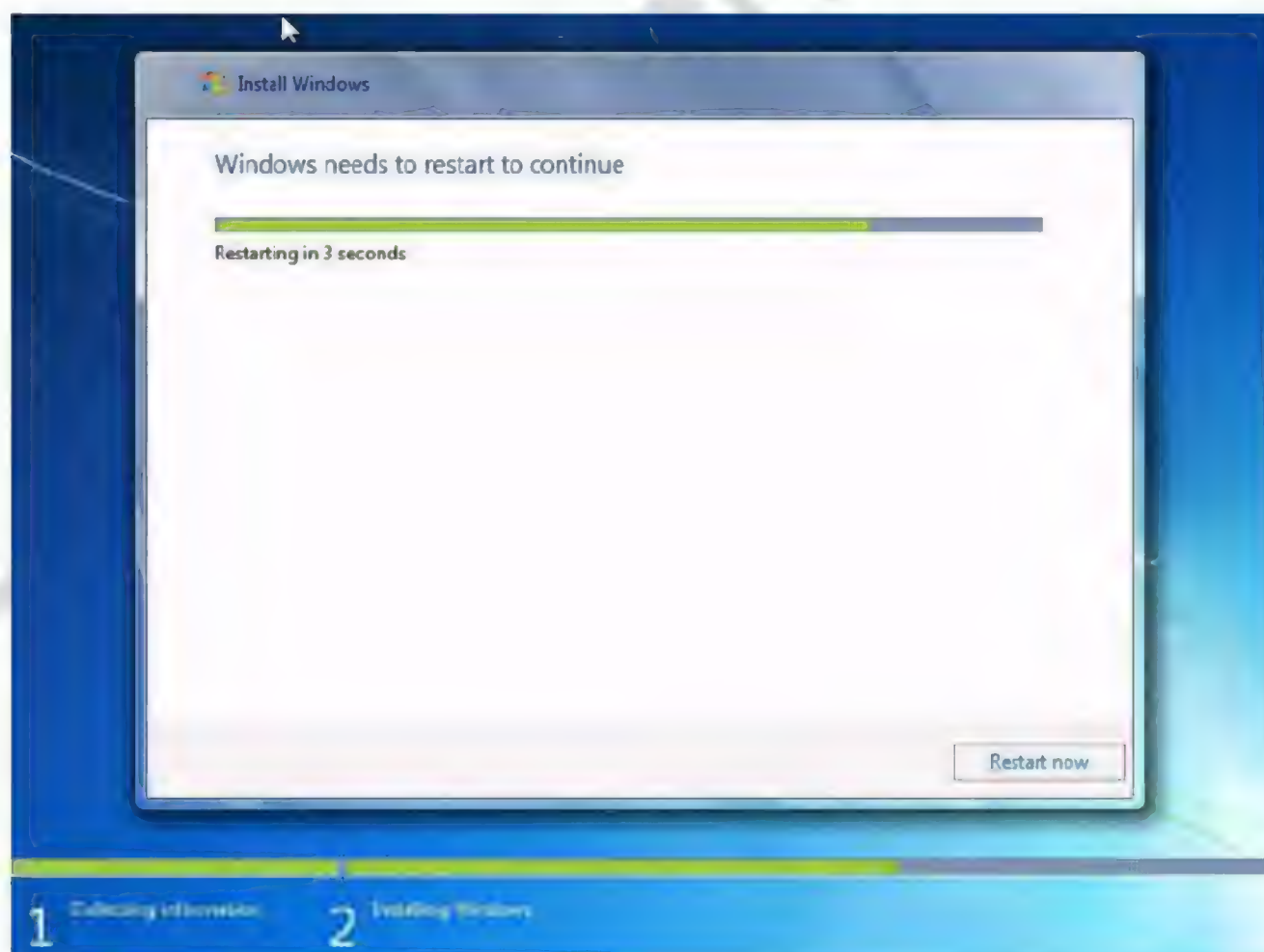




15. Windows Installation will start.

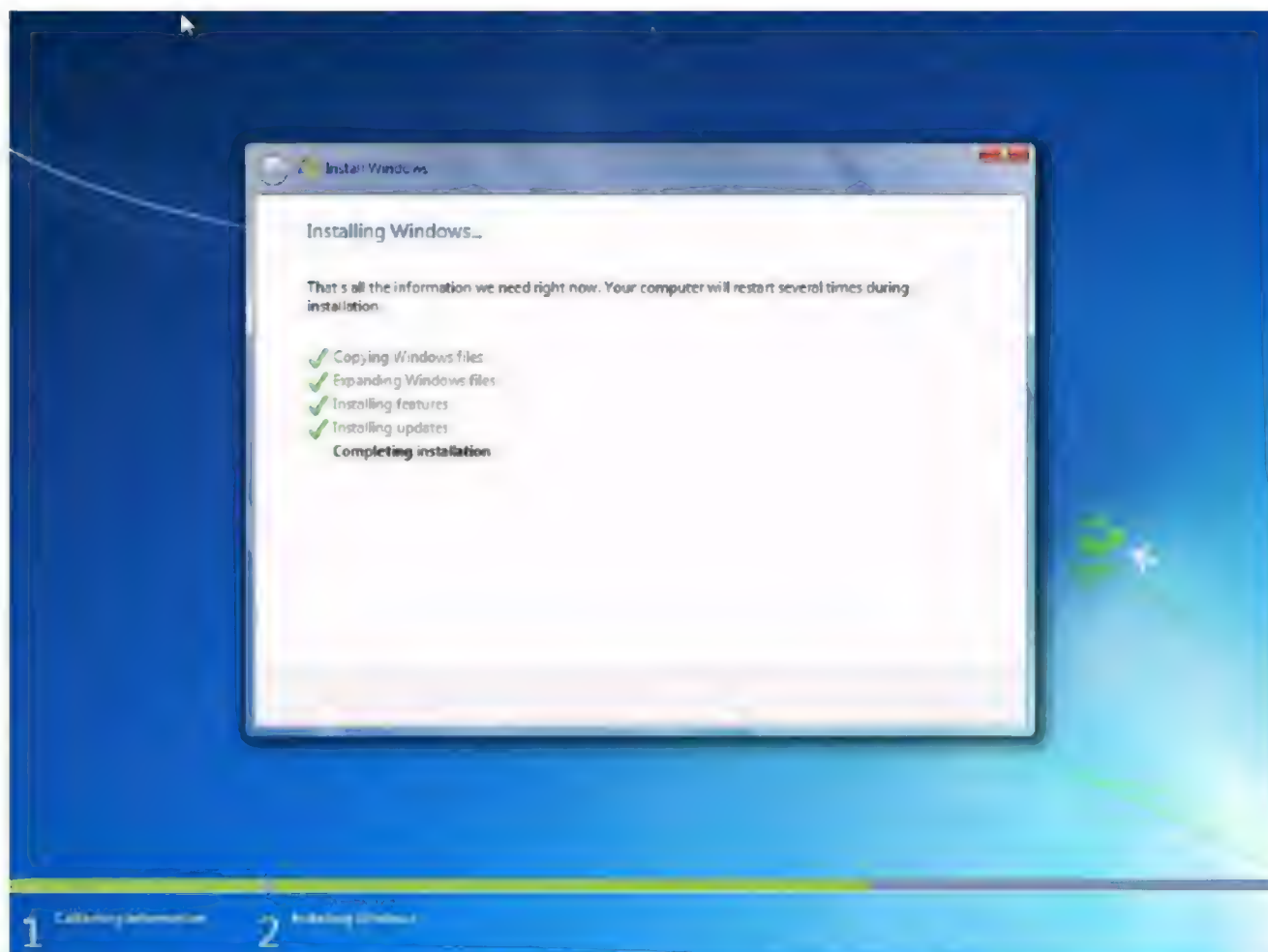


16. System Restarts.





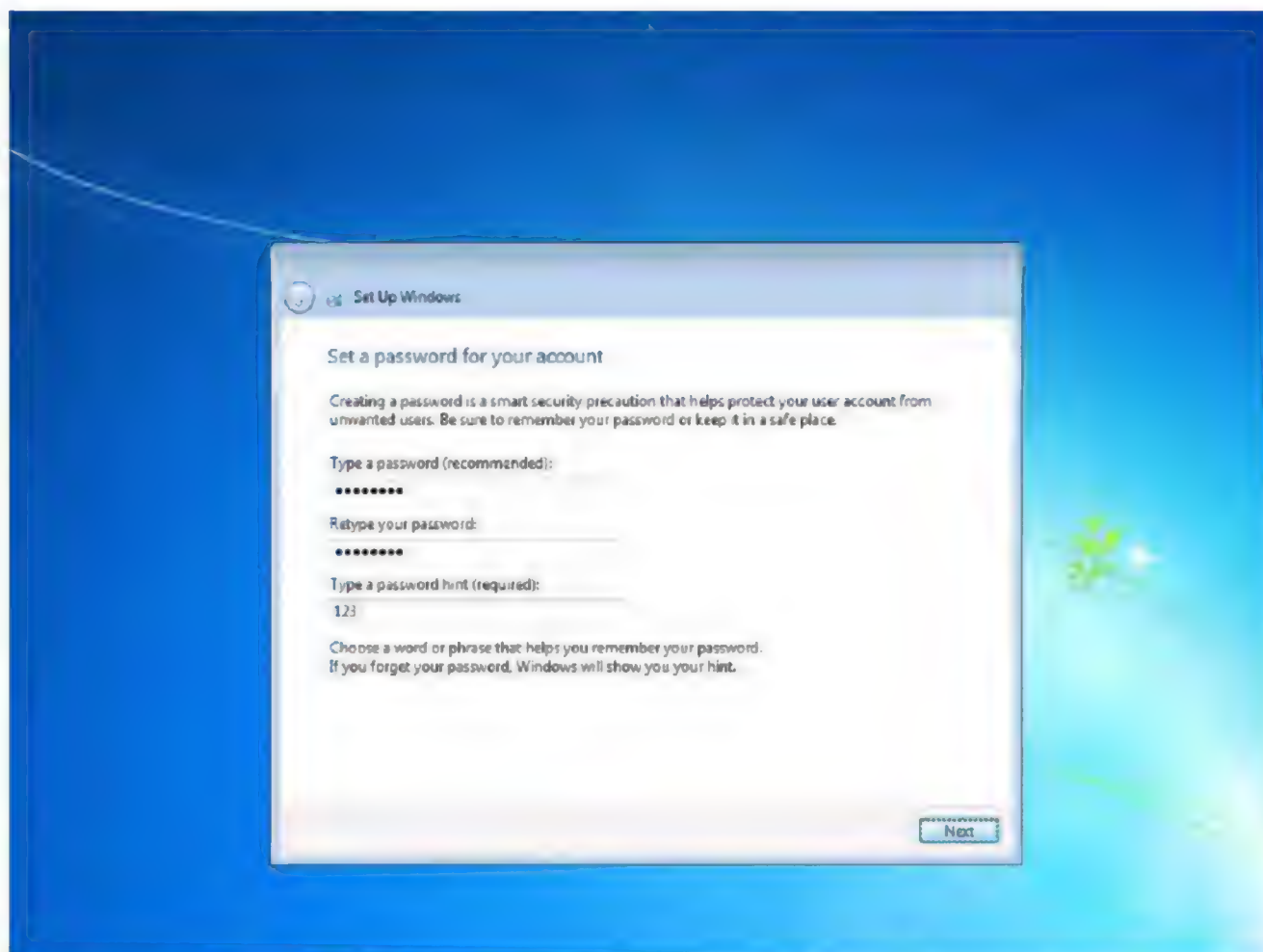
17. Completes the Installation, and system will be restarted.



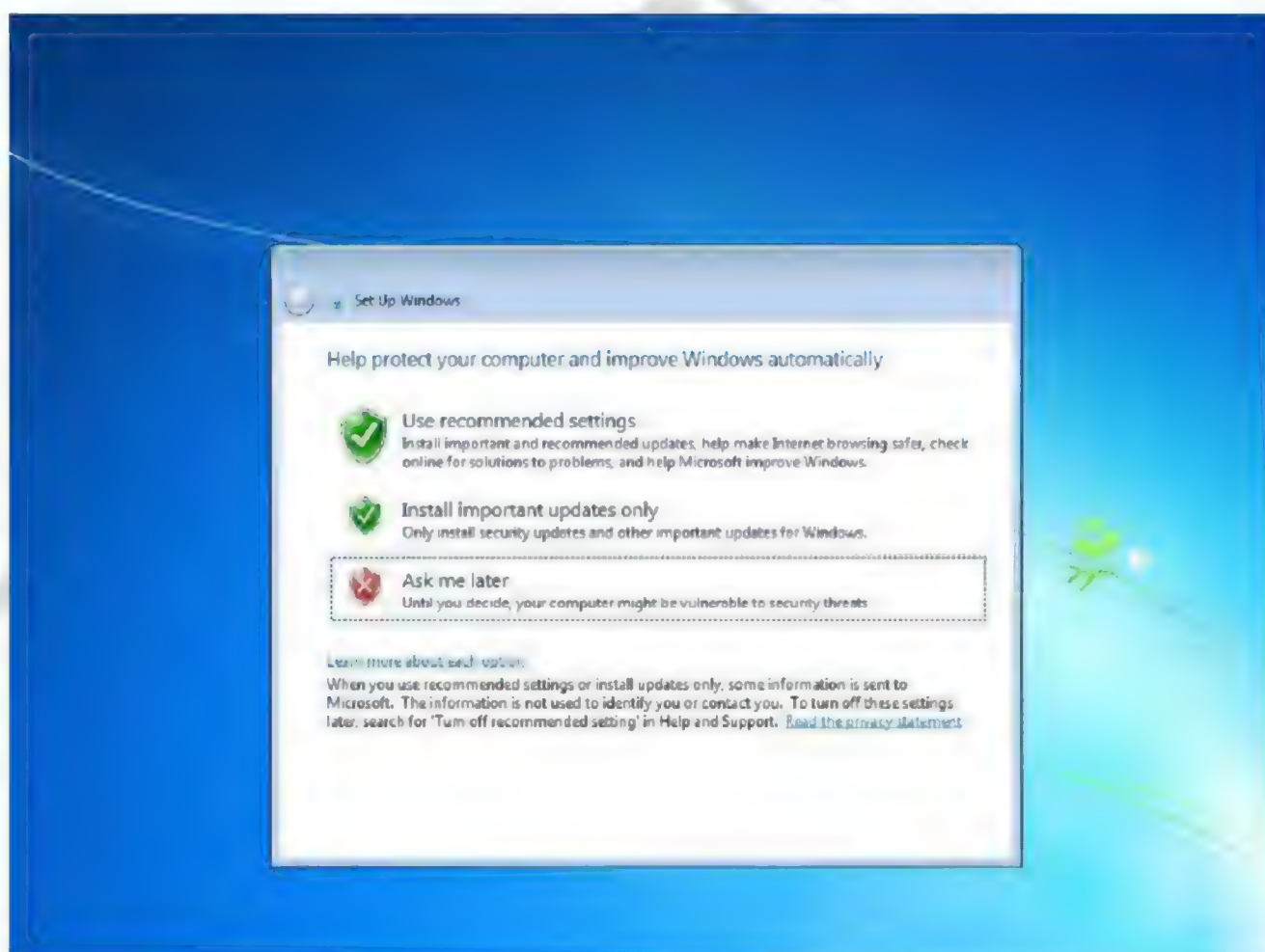
18. Enter the **User Name** and **Computer Name**, click **Next**.



19. Set a password for the account, and click **Next**.



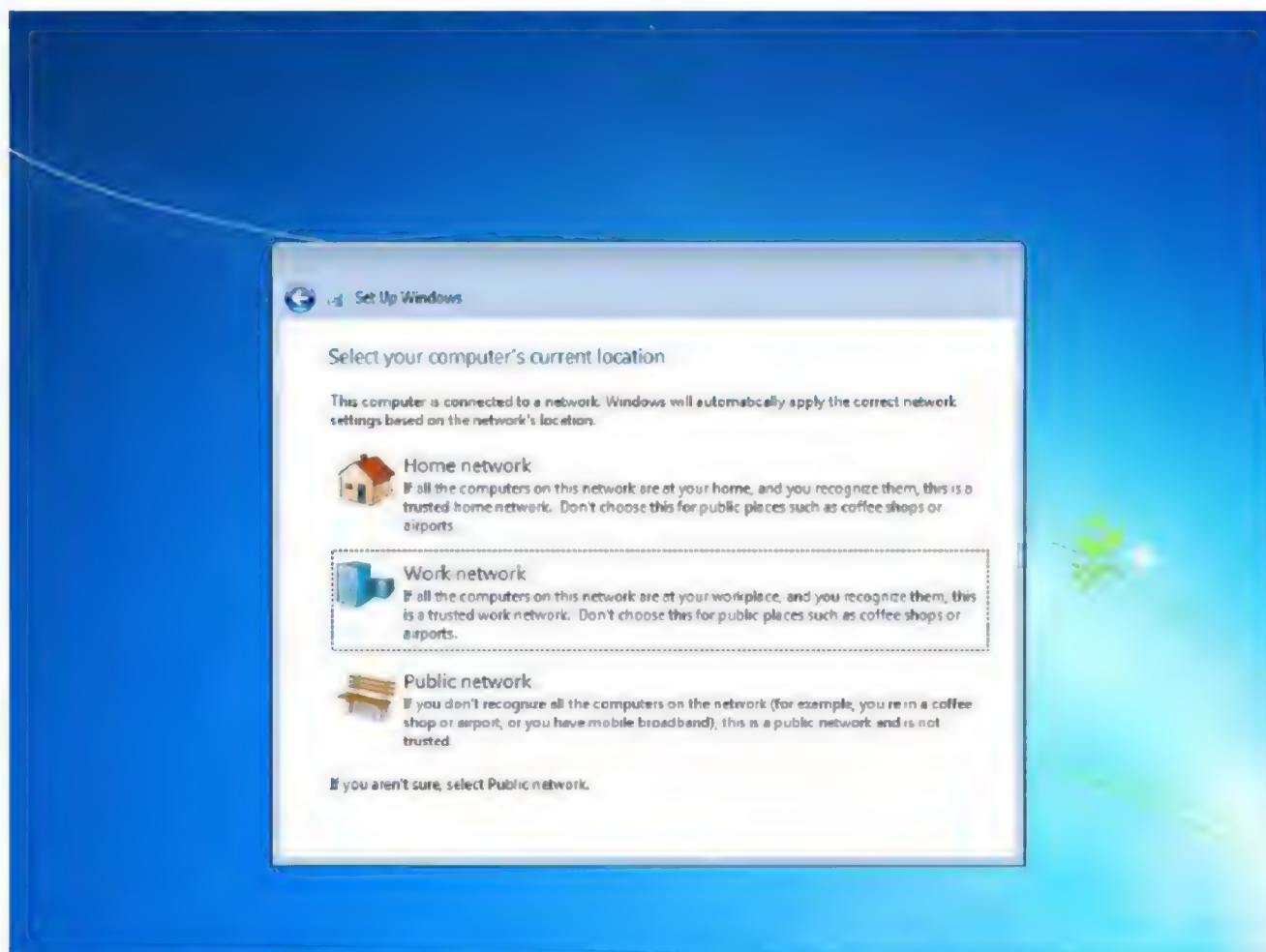
20. Configure Automatic Updates **Ask me later**.



21. Select the **Time zone** and click **Next**.



22. Select the location of your computer **Work**.



23. Windows finalize the settings.





24. Enter the **Password** to log on to the computer.



25. Finally Operating System is installed and the **User** has logged in.



## Lab – 3: Creating Local User Accounts

**Objective:**

To create local user accounts in a Computer


**Pre-requisites:**

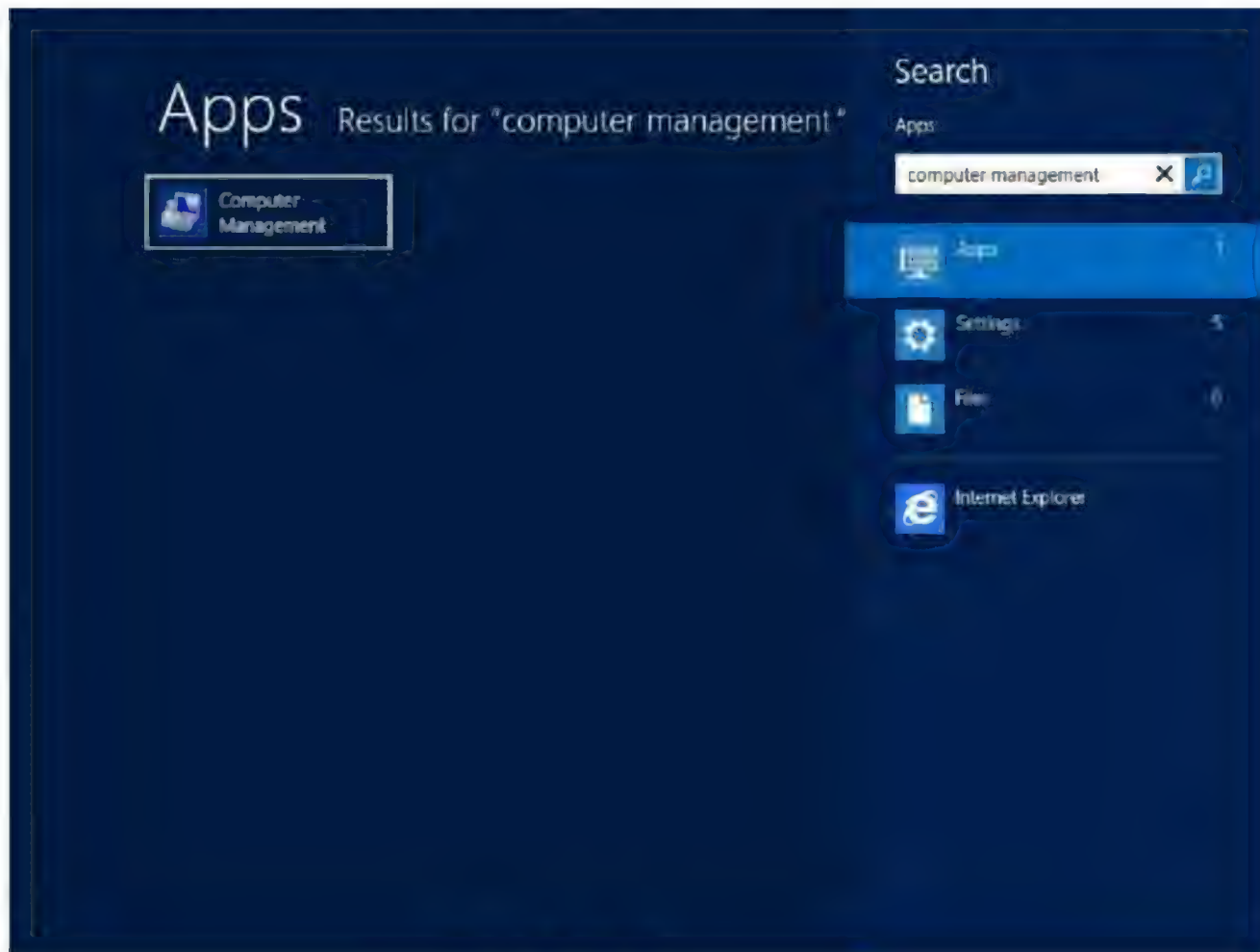
Before working on this lab, you must have

- A Computer running with windows server 2012 or windows 7.

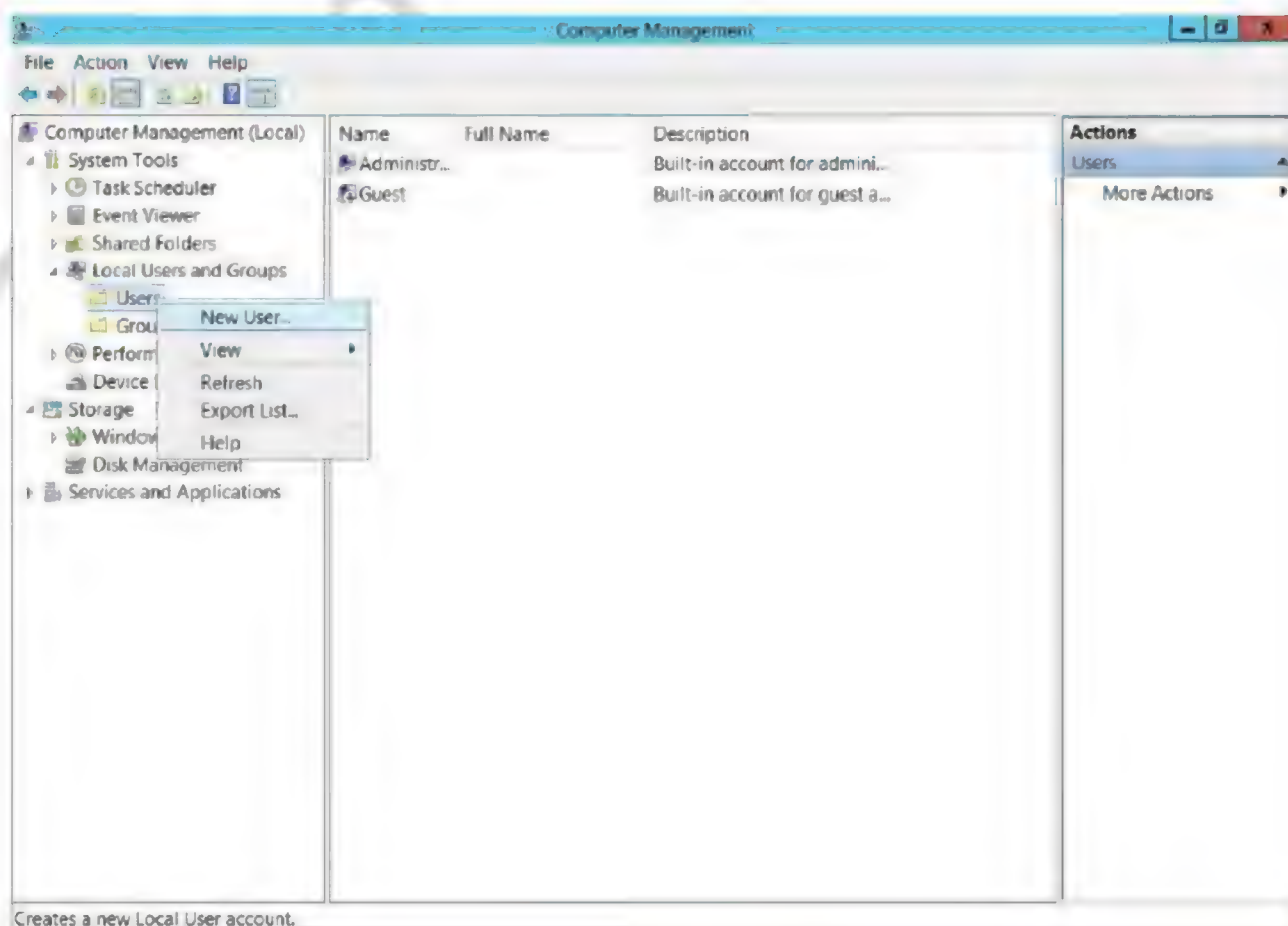


**Steps:**

1. Login as the **Administrator** to the **Computer**.
2. Press Windows Key  to go to Start, type Computer Management in Search Apps, and select **Computer Management**.



3. Expand **Computer Management** → Expand **System Tools** → Expand **Local Users and Groups** → right click **Users** and then click **New User**.



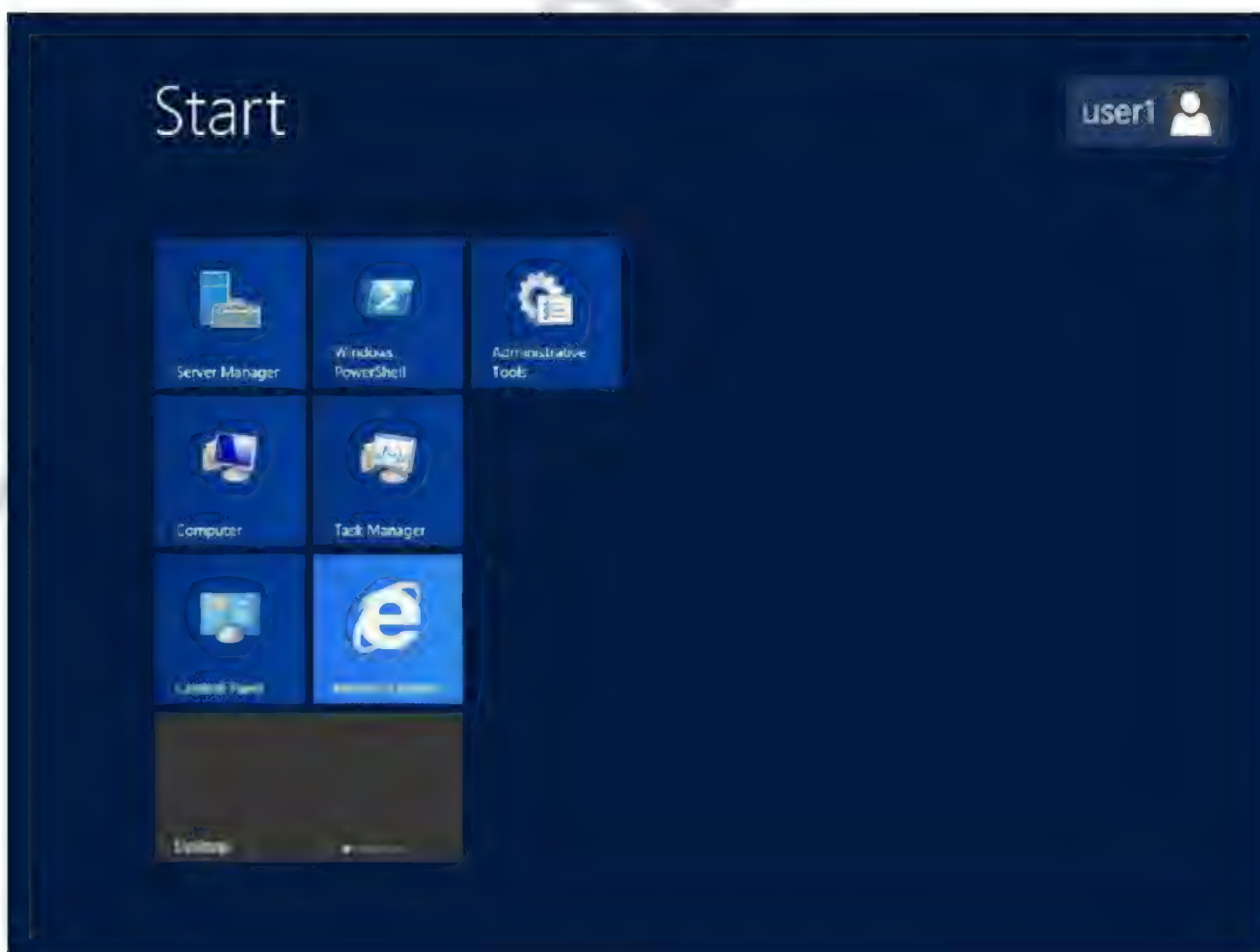


4. Enter **User Name** and set **Password**, **Confirm Password** and click **Create**.

5. Click **Close**, and then **Close Computer Management**.

### **Verification:**

1. Press Ctrl + Alt + Del → Click **Switch User** or **Logoff Administrator**.
2. Login as User (**User1**) on same computer.



## Lab – 4: Converting Windows Server 2012 GUI to Core

**Objective:**

To convert windows server 2012 gui to core

**Pre-requisites:**

Before working on this lab, you must have

- A Computer running with windows server 2012.

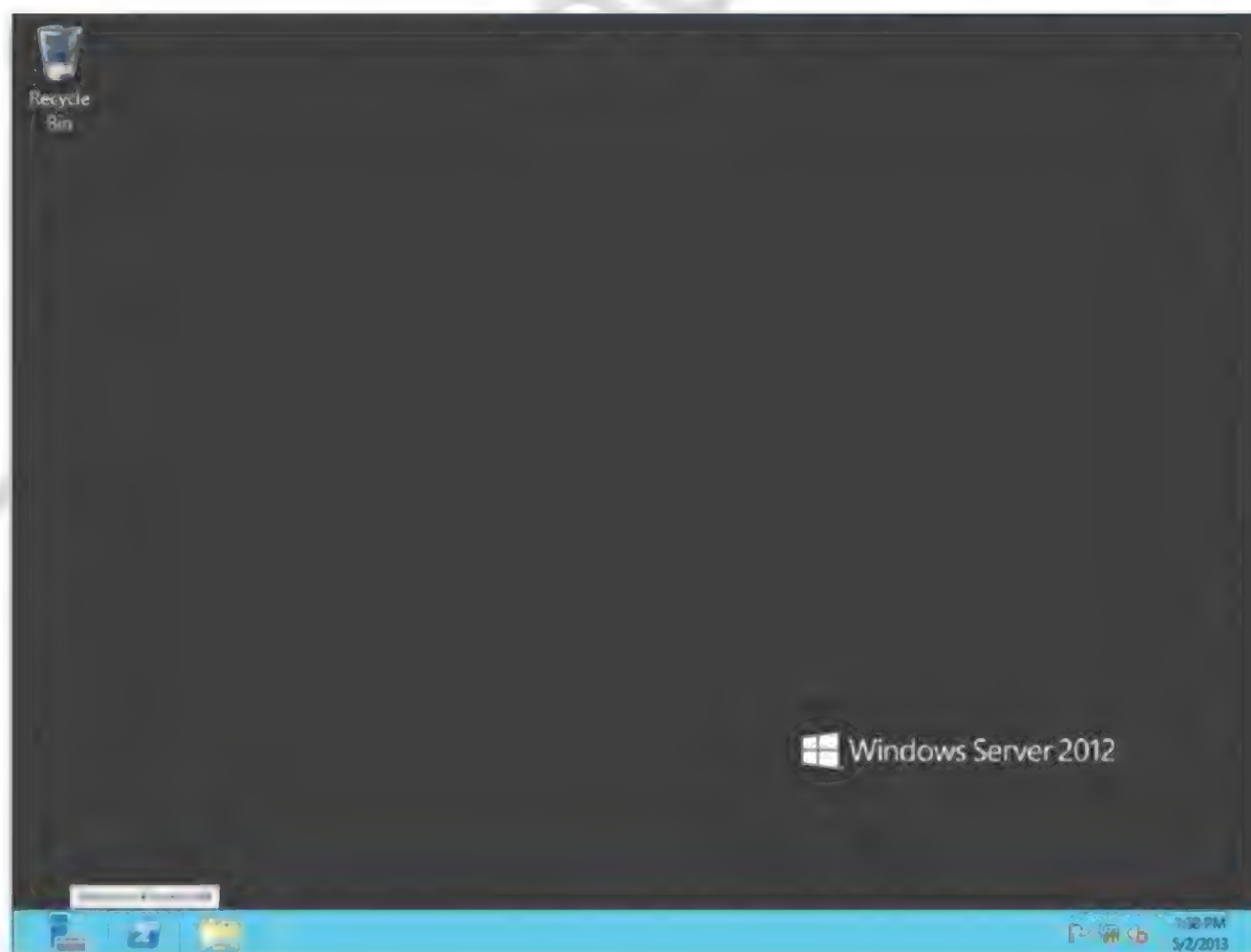


**Steps:**

1. Login to Computer as Administrator



2. Click **Windows PowerShell**.



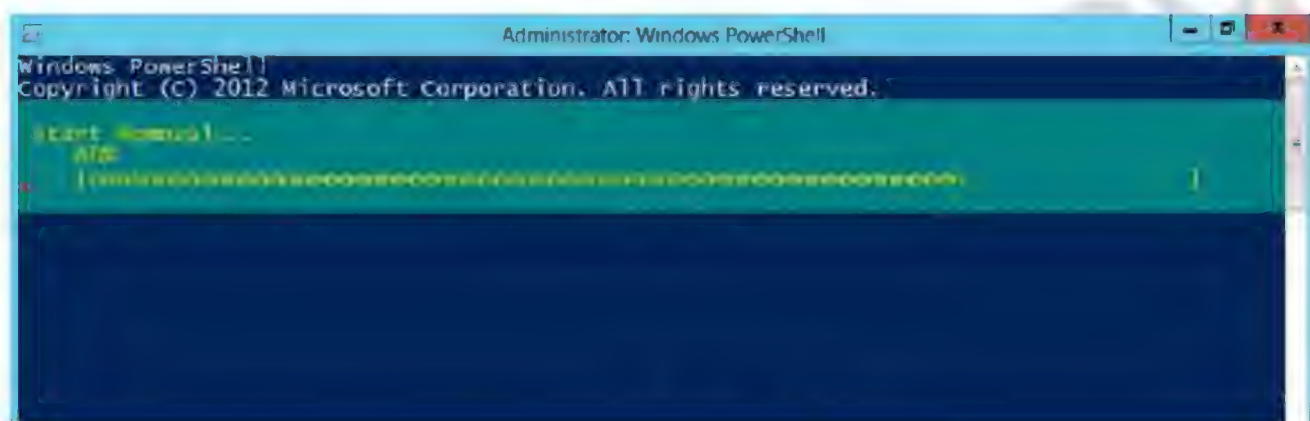


3. Type the following command

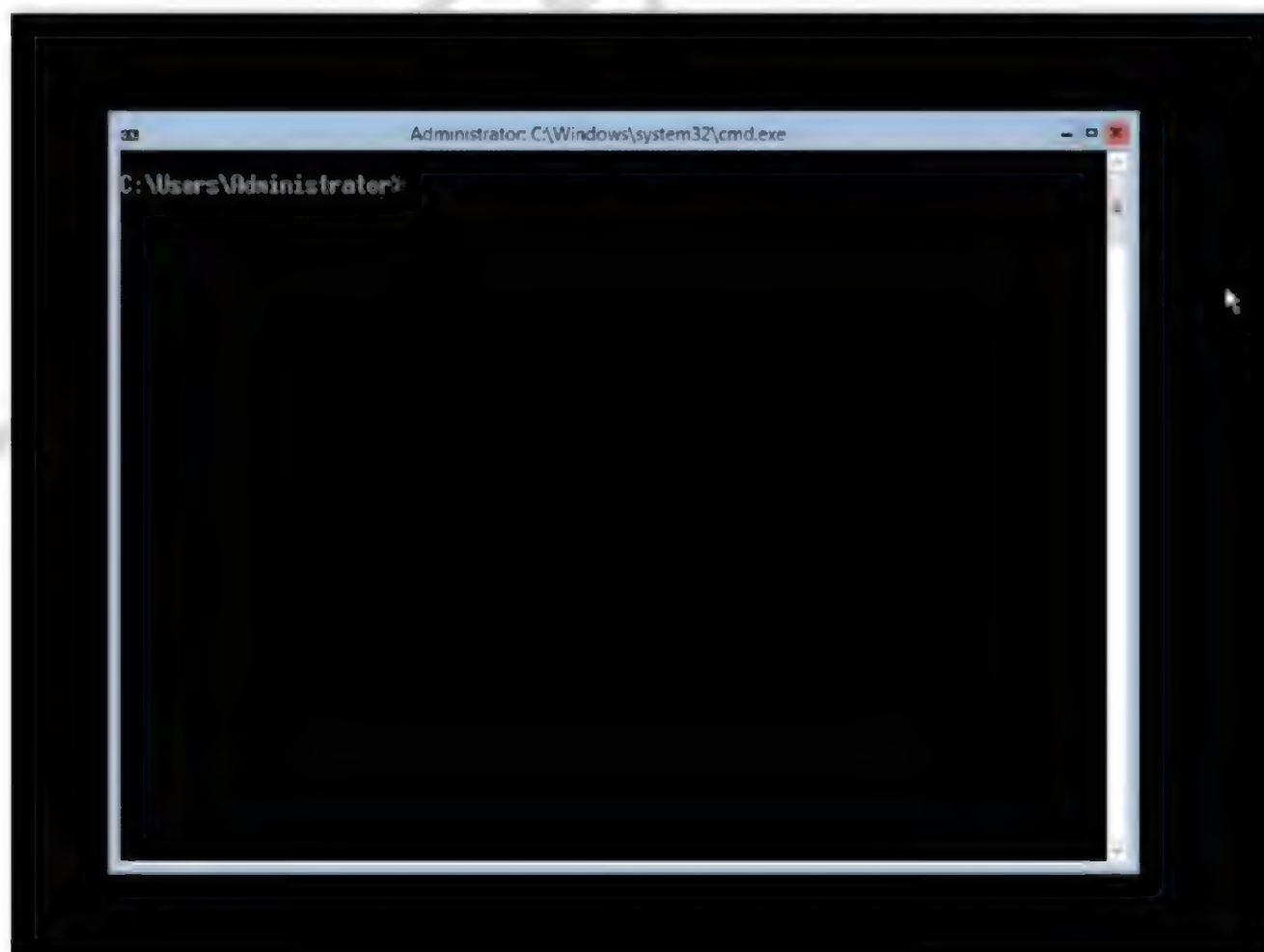
**Uninstall-WindowsFeature Server-GUI-Mgmt-Infra, Server-GUI-Shell -Restart**



4. The conversion starts and the computer restarts.



5. Login as Administrator and finally GUI is now converted to Server Core.



## Lab – 5: Converting Windows Server 2012 Core to GUI

**Objective:**

To convert windows server 2012 core to gui

**Pre-requisites:**

Before working on this lab, you must have

- A Computer running with windows server 2012.

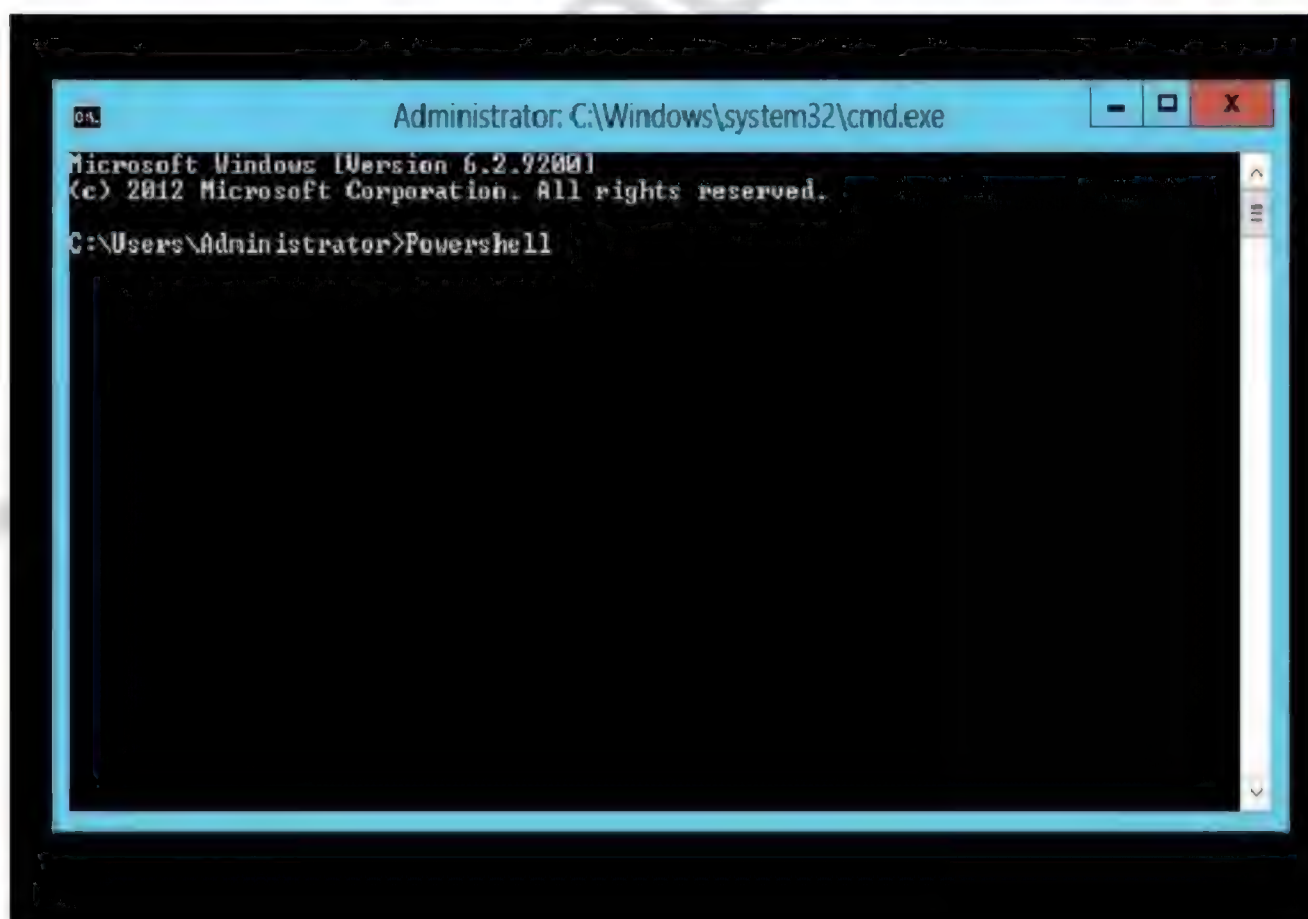


**Steps:**

1. Login to Computer as Administrator



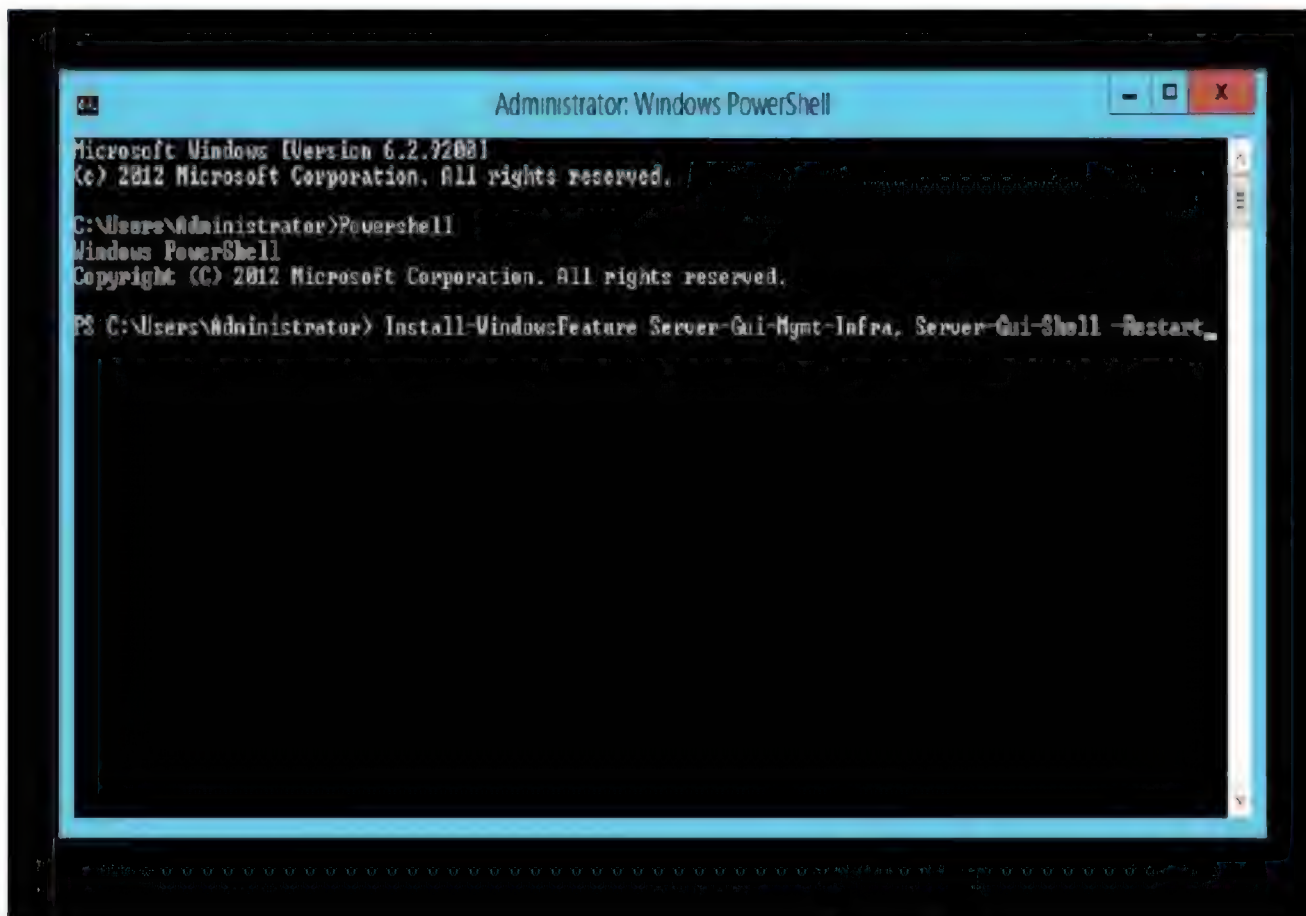
2. In Command Prompt, type **PowerShell**.



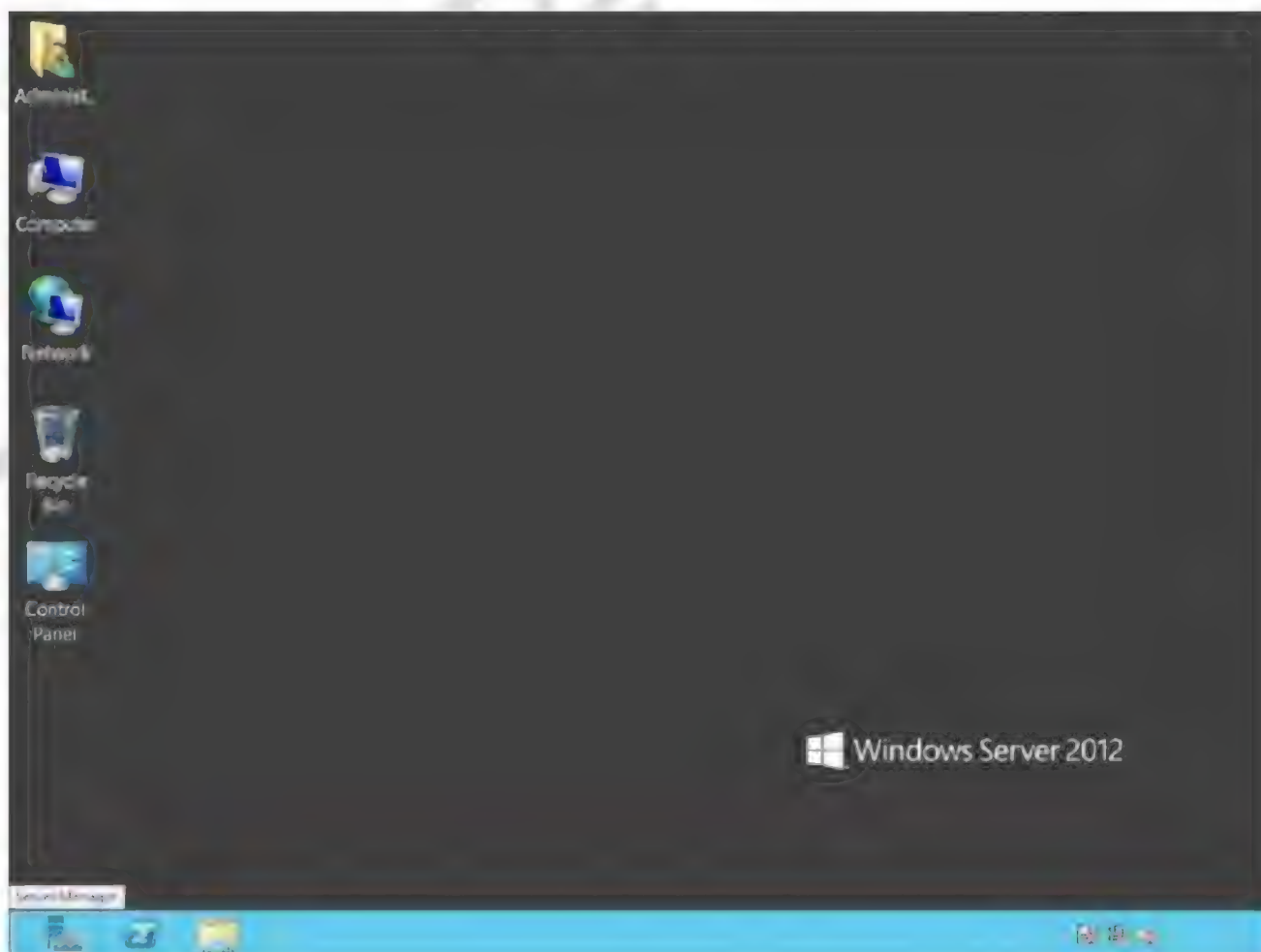


3. In Power Shell type the following command to convert Core to GUI.

**Install-Windows Feature Server-GUI-Mgmt-Infra, Server-GUI-Shell -Restart**



4. It installs the required GUI features and restarts
5. Login as Administrator and finally Core is now converted to GUI.



## Lab – 6: Installing Active Directory Domain Controller

**Objective:**

To Install Active Directory Domain Services for promoting a new Domain Controller

**Pre-requisites:**

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System.

**Topology:**

MICROSOFT.COM

**SYS1**

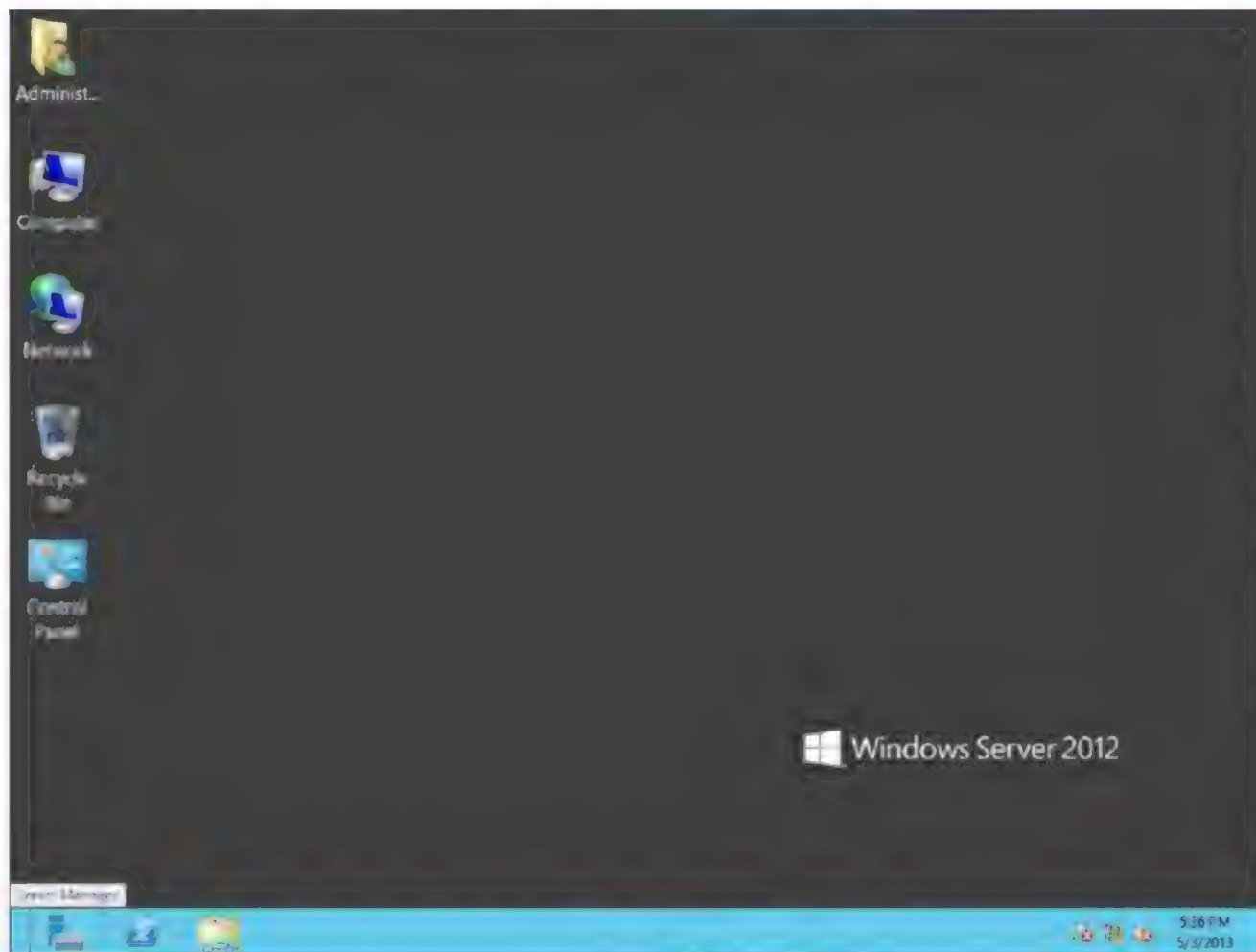
**Domain Controller**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

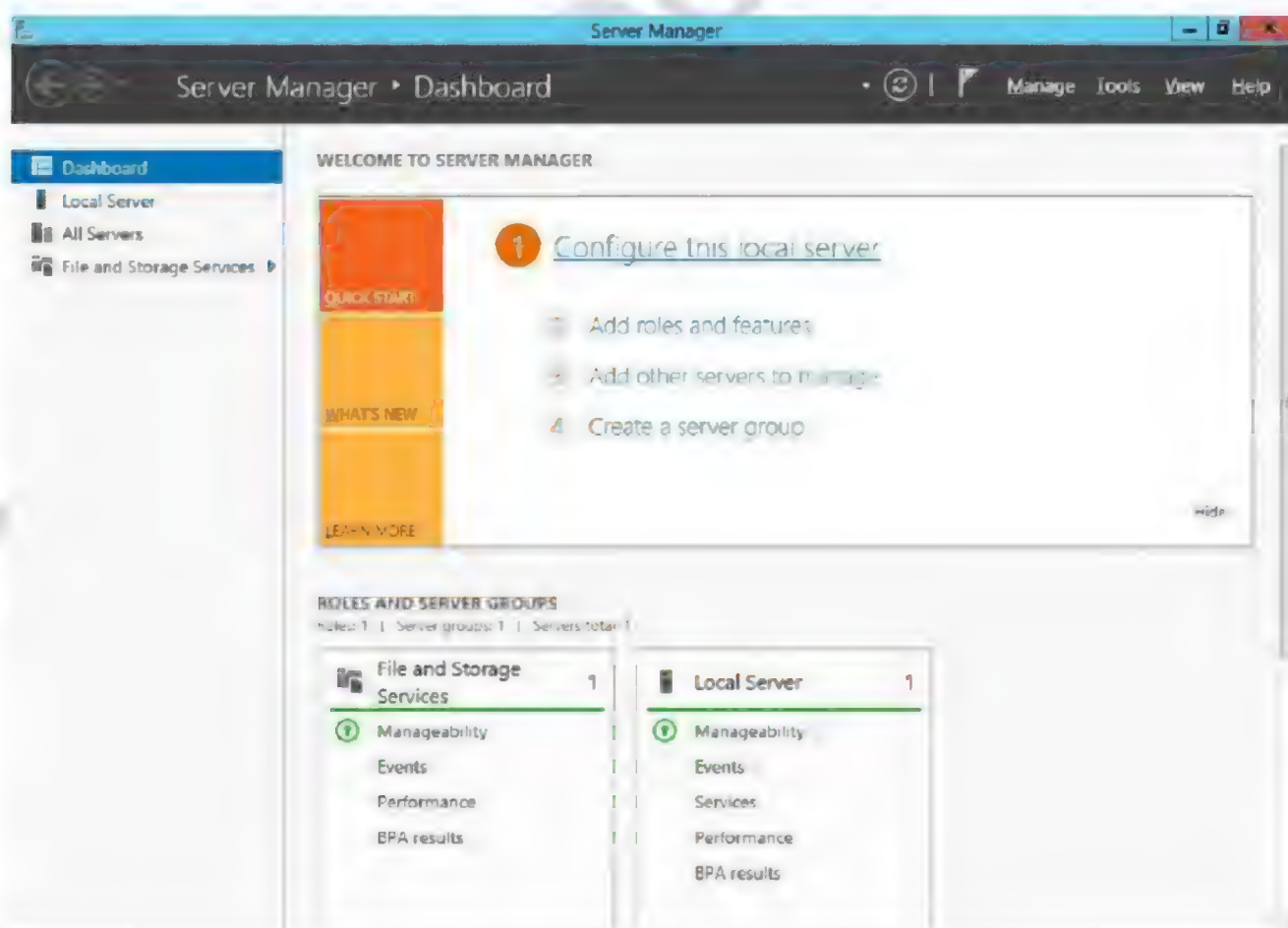


## Assigning IP Address

1. Click **Server Manager**.

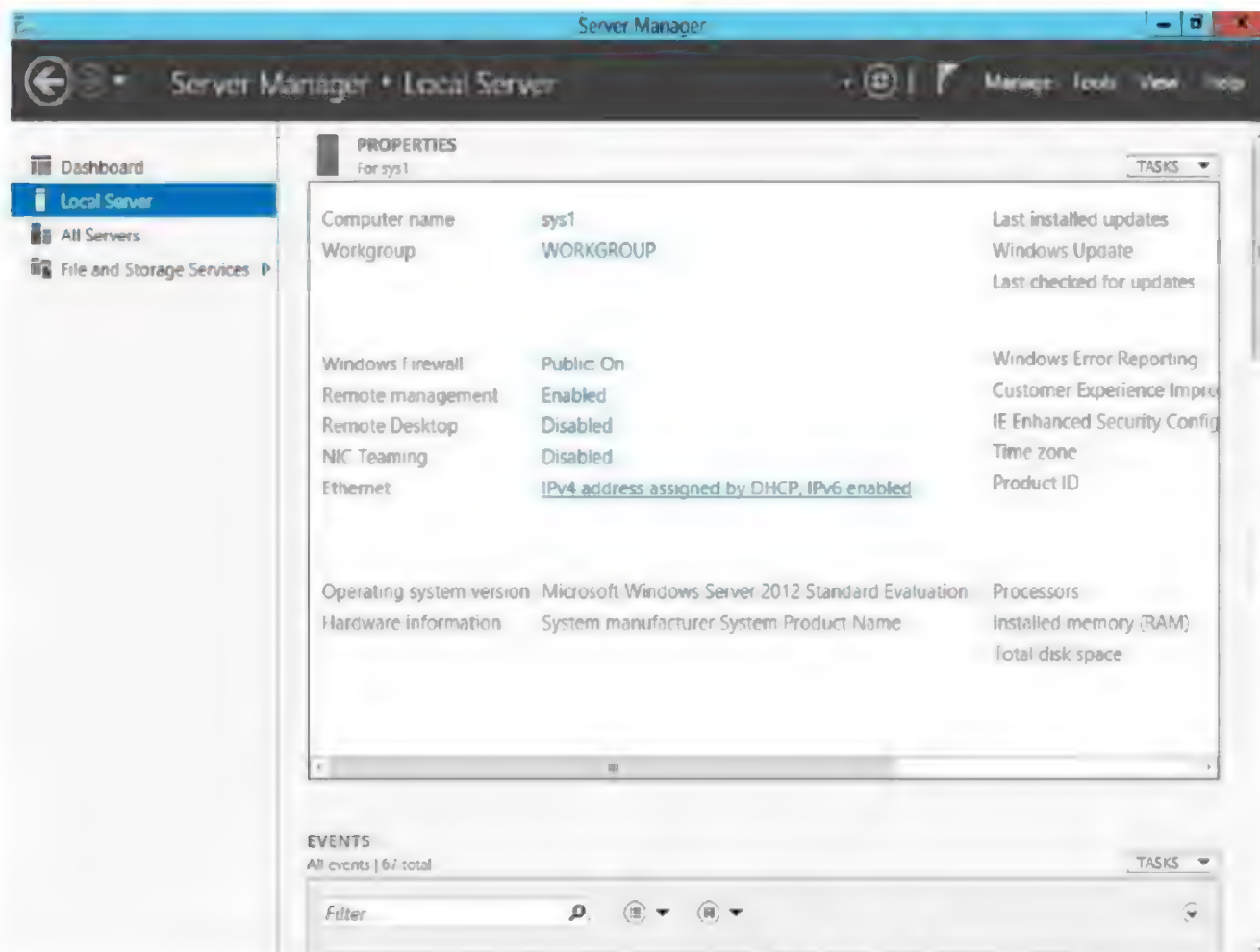


2. In Server Manager Dashboard, Click **Configure this local server**.

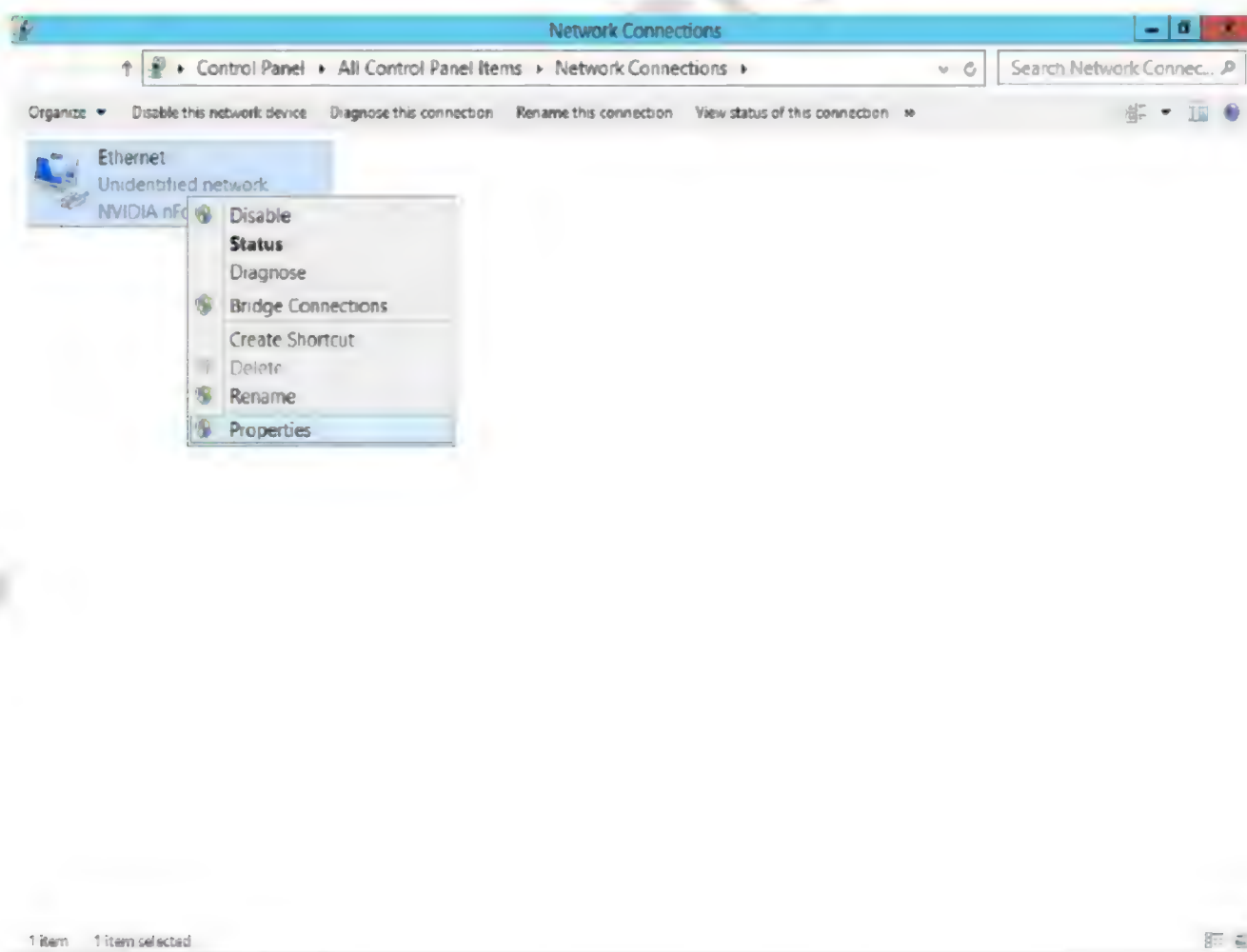




3. In Local Server, select Ethernet IPv4 address assigned by DHCP.

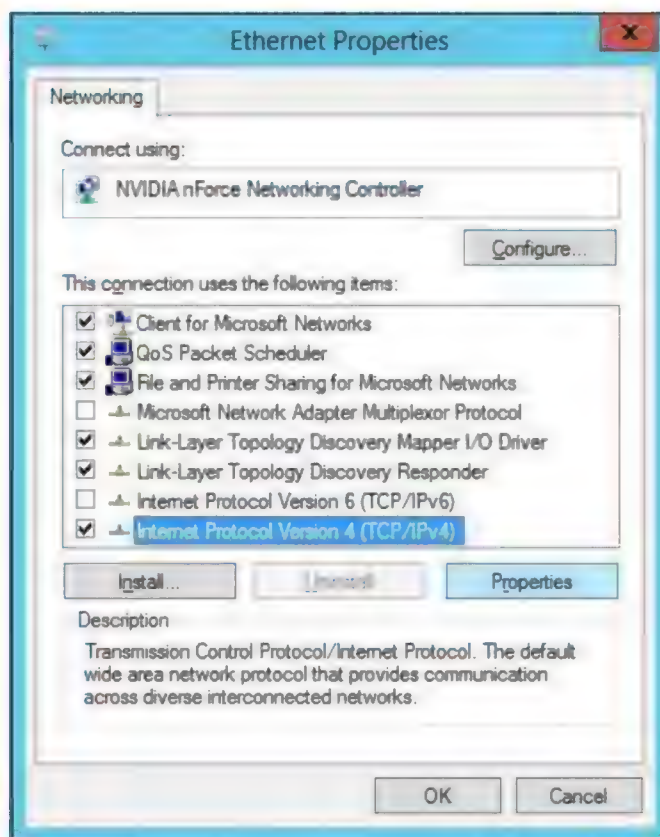


4. Right click **Ethernet**, select **Properties**.

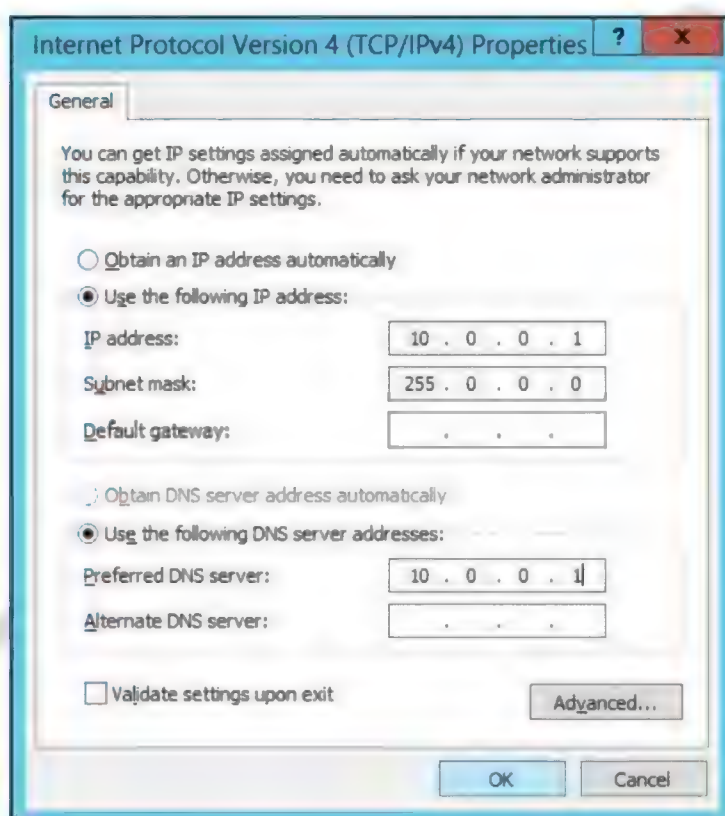


5. Select **Internet Protocol Version 6 (TCP/IPv6)** and **uncheck the box**.

6. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



7. Select **Use the following IP address** and enter the IP address and click Subnet mask, it will be entered automatically and select **Use the DNS Server addresses** and enter the **Preferred DNS Server address**



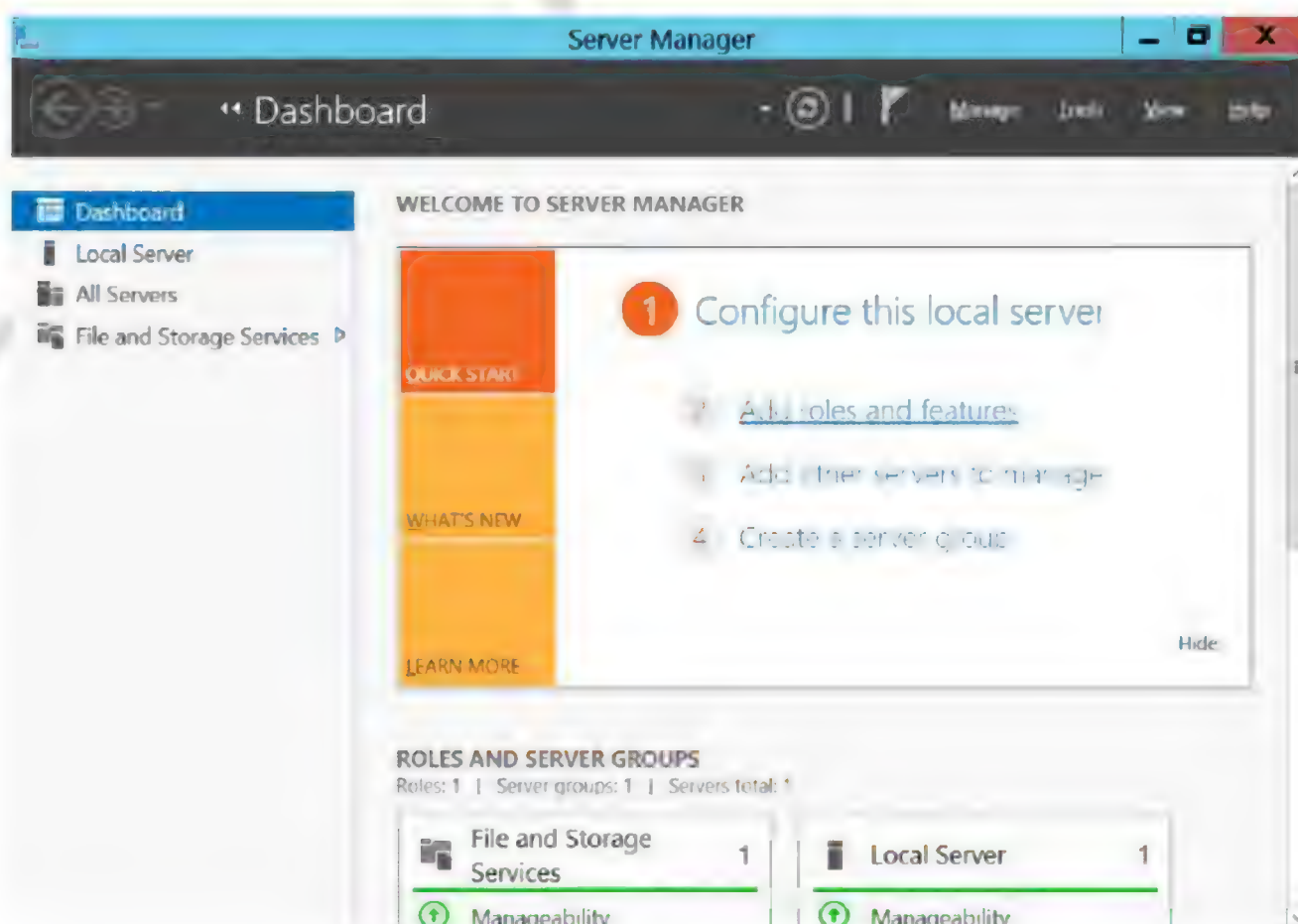
8. Click **OK**, and **OK**.

## Installing Active Directory Domain Services

1. Log in as **Administrator** to the **Workgroup Computer**.
2. Assign **IP Address** and preferred **DNS Server Address**.
3. Click **Server Manager**

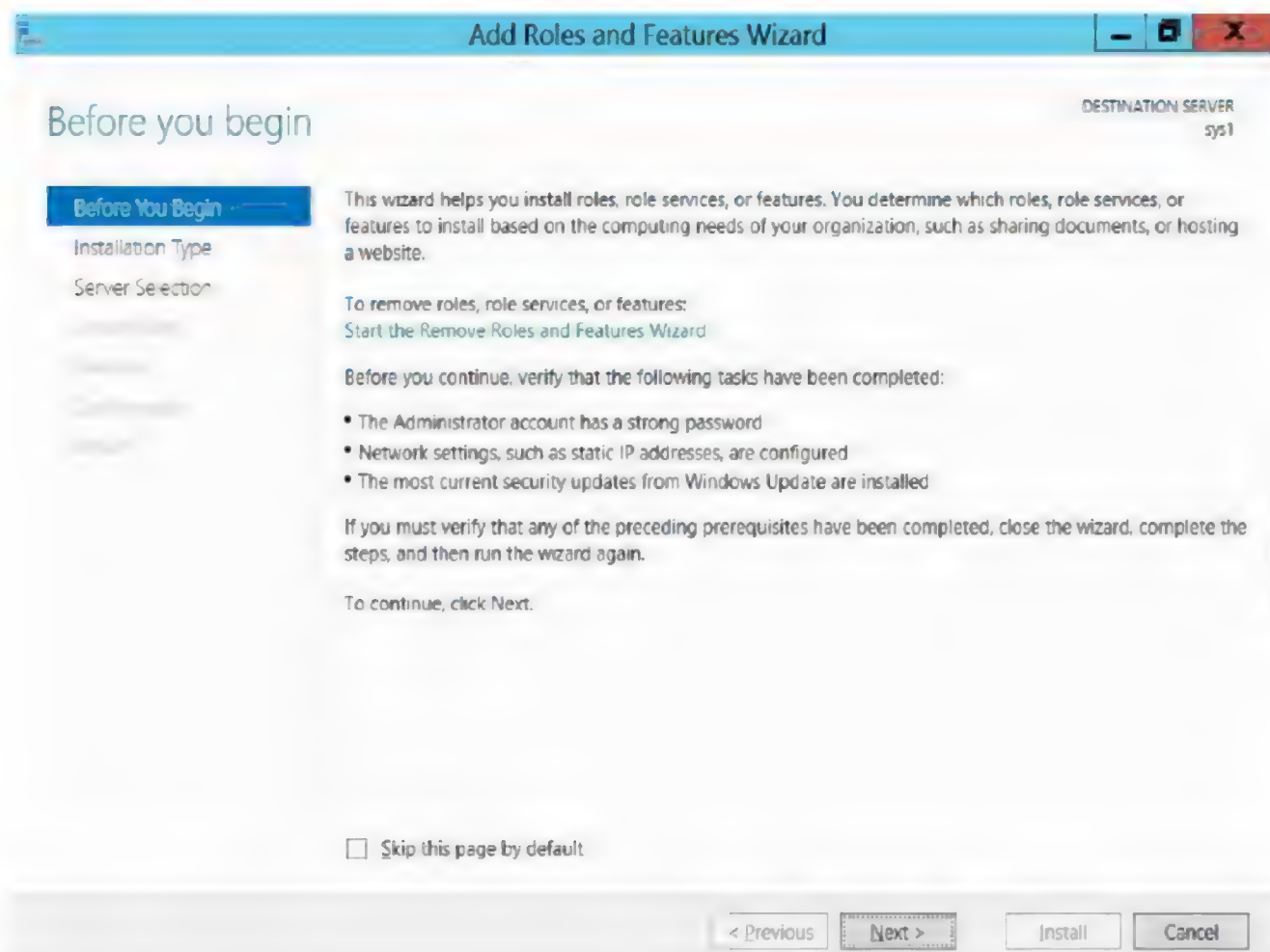


4. In Server Manager Dashboard, Click **Add roles and features**.

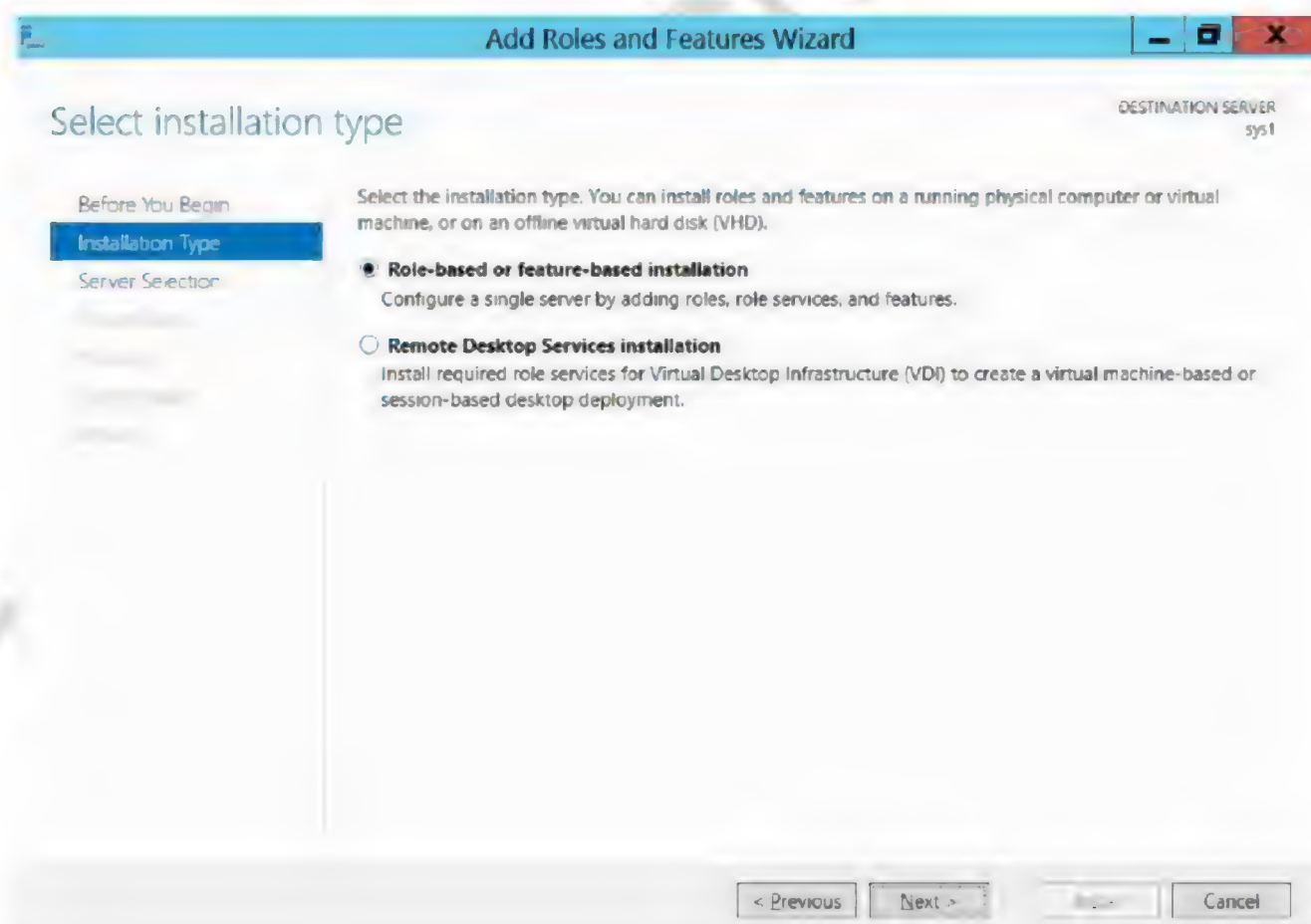




5. In before you begin page, click **Next**.



6. In Select installation type, select **Role-based or feature-based installation**, click **Next**.



7. In Select destination server, from Server Pool select **SYS1**, click **Next**.

**Add Roles and Features Wizard**

DESTINATION SERVER  
sys1

Select destination server

Before You Begin  
Installation Type  
**Server Selection**  
Server Roles  
Features

Select a server or a virtual hard disk on which to install roles and features.

☒ Select a server from the server pool  
☐ Select a virtual hard disk

Server Pool

Filter:

Name	IP Address	Operating System
sys1	10.0.0.1	Microsoft Windows Server 2012 Standard Evaluation

1 Computer(s) found

This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

< Previous Next > Finish Cancel

8. In Roles, check the box **Active Directory Domain Services**.

**Add Roles and Features Wizard**

DESTINATION SERVER  
sys1

Select server roles

Before You Begin  
Installation Type  
Server Selection  
**Server Roles**  
Features

Select one or more roles to install on the selected server.

Roles

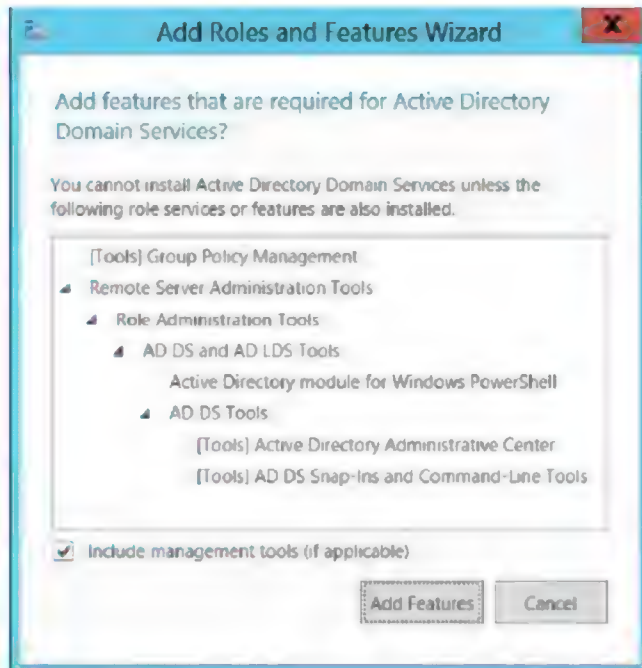
- ☐ Active Directory Certificate Services
- ☒ **Active Directory Domain Services**
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Application Server
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ☒ File And Storage Services (Installed)
- ☐ Hyper-V
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services

Description

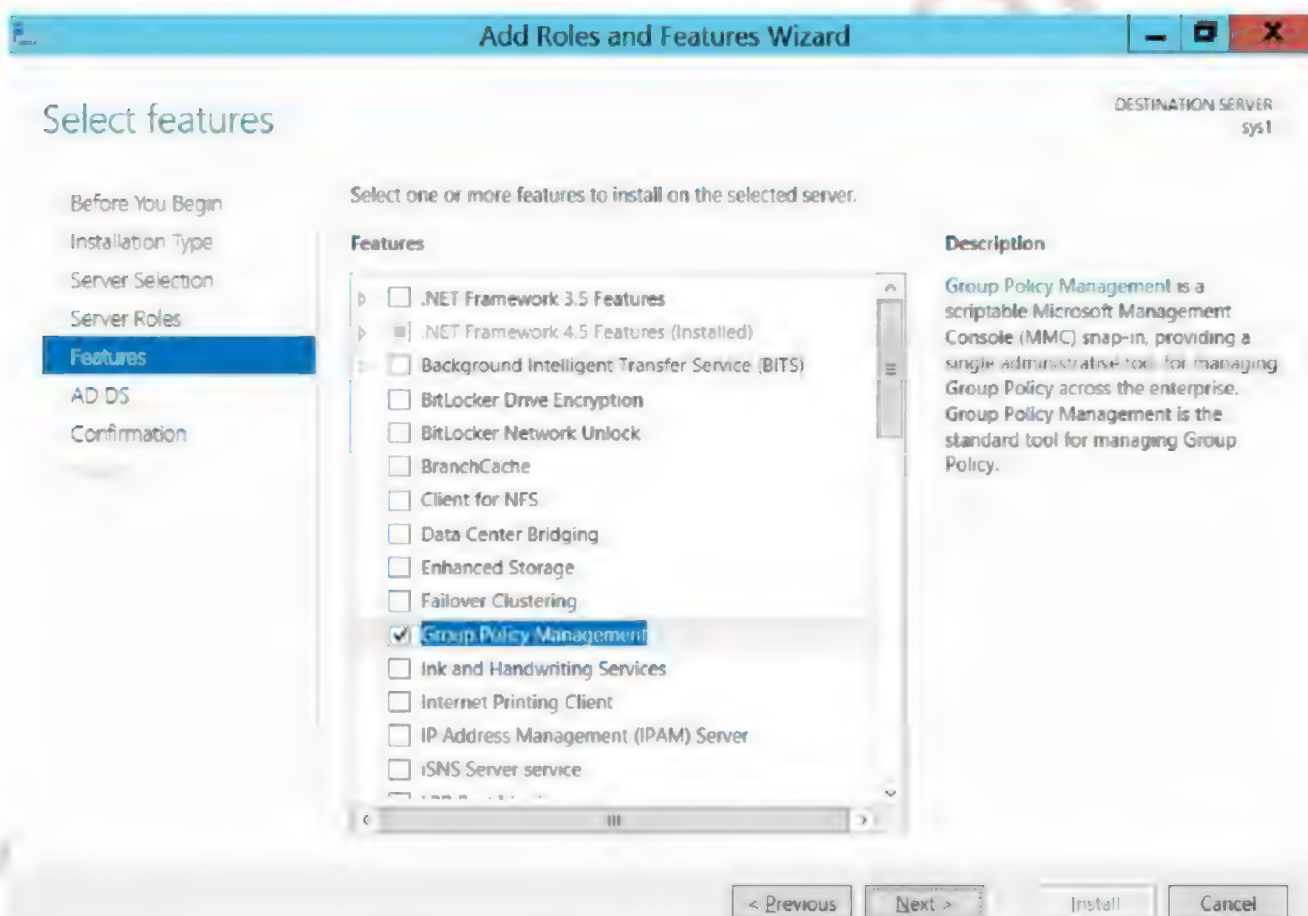
Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.

< Previous Next > Finish Cancel

9. Click **Add Features**, to install the required features for Active Directory Domain Services. Click **Next**.

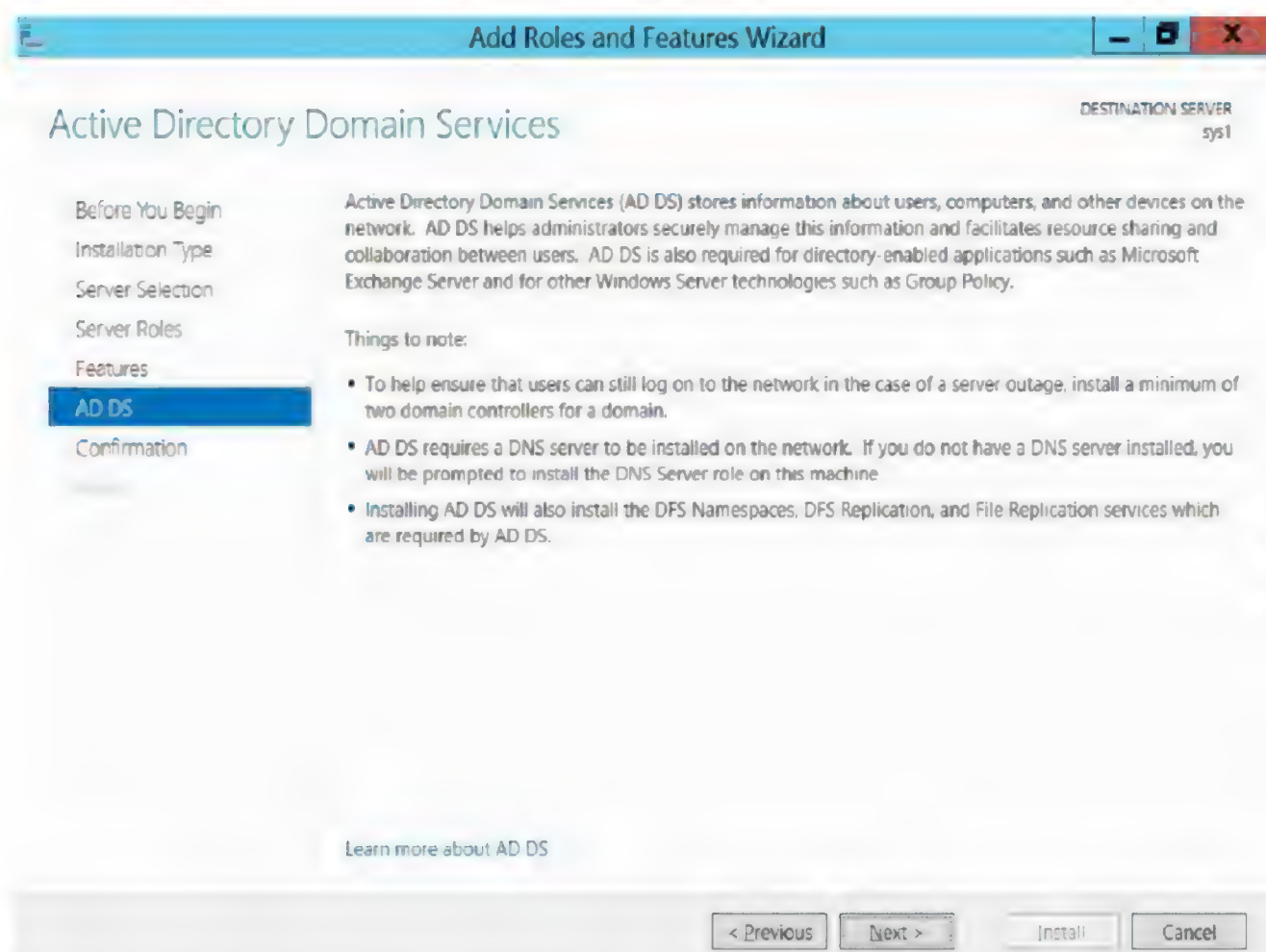


10. In Select features wizard, click **Next**.

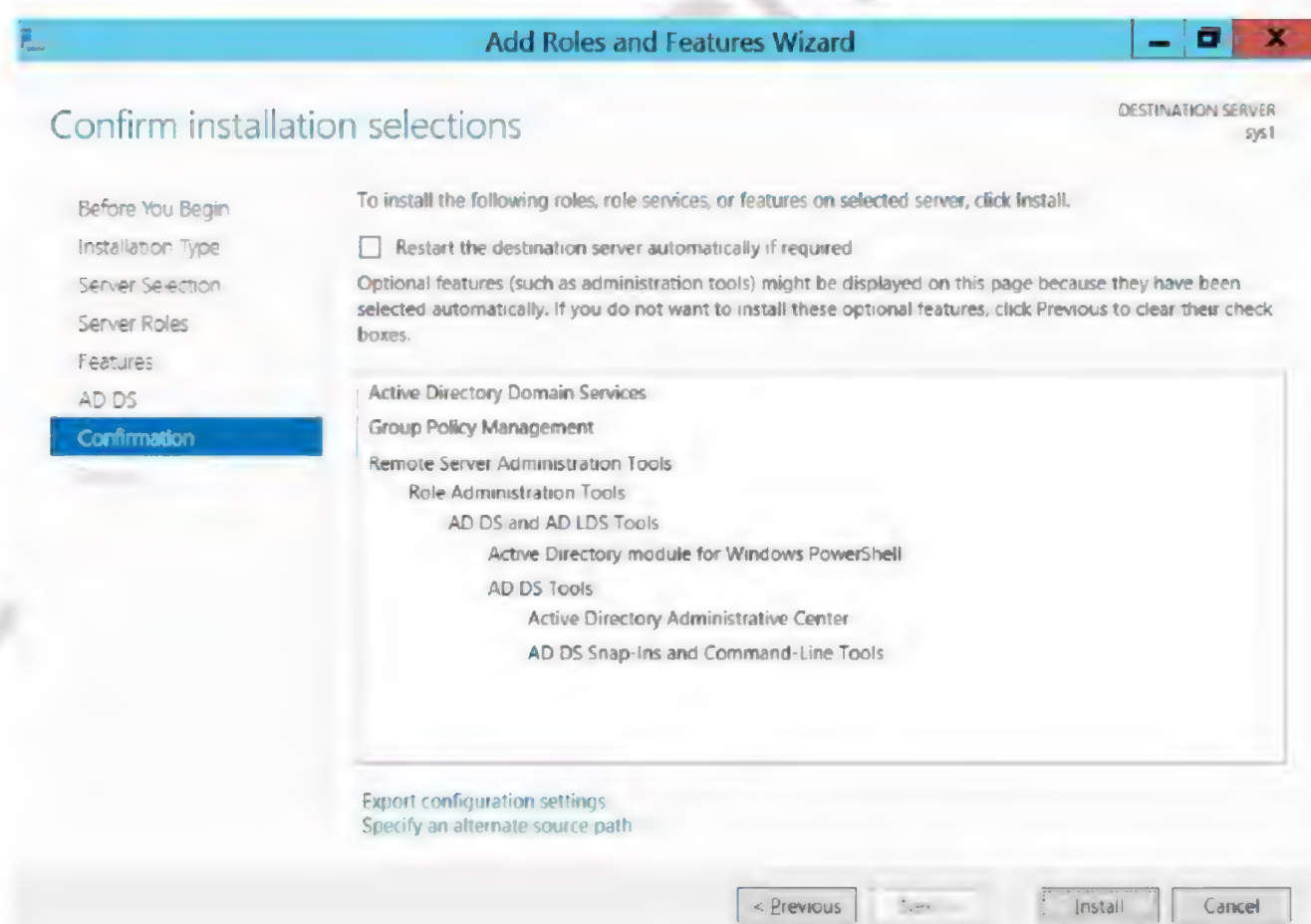




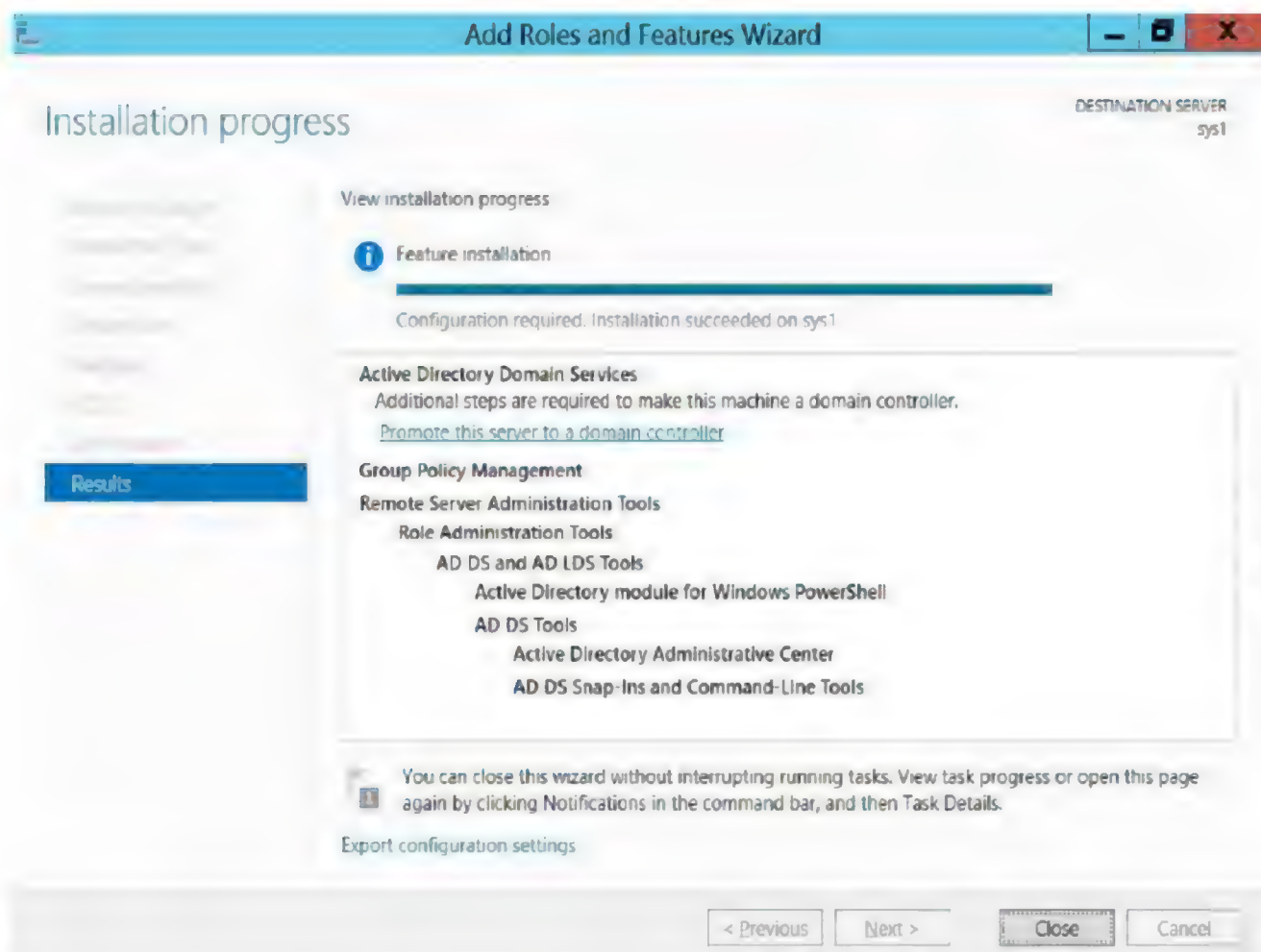
11. In Active Directory Domain Services wizard, click **Next**.



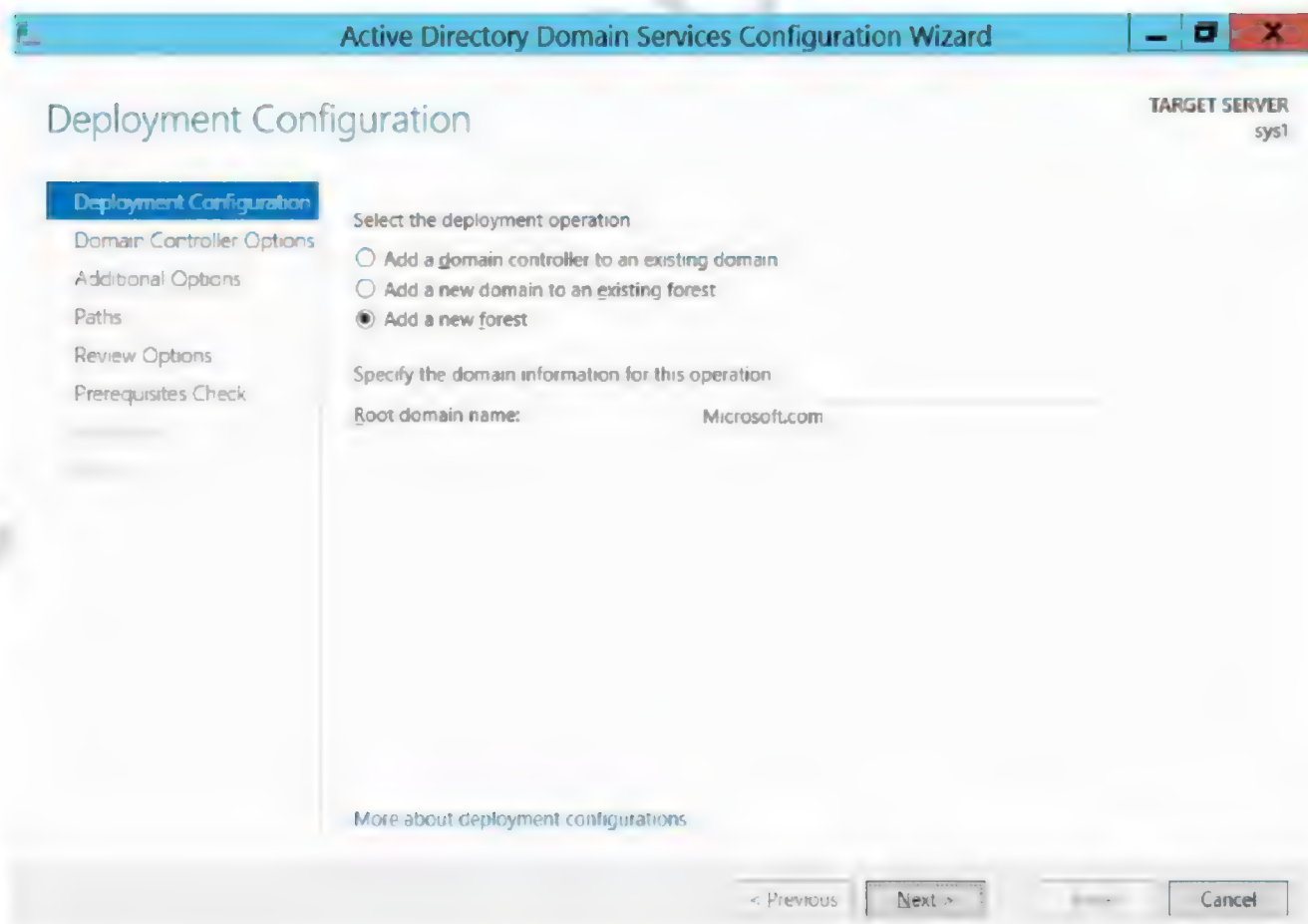
12. Check the box **Restart the destination server automatically if required**. Click **Install**.



13. Click **Promote this server to a domain controller.**



14. In Deployment Configuration wizard, select **Add a new forest**, enter the **Root domain name** (Ex: **Microsoft.com**) and click **Next**.



15. In Domain Controller Options, change **Forest** and **Domain functional level** to **Windows Server 2003**, and Domain Name System server. Type the Directory Services Restore Mode **Password** and **Confirm Password** and click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main heading is 'Domain Controller Options'. On the left, a navigation pane lists: 'Deployment Configuration', 'Domain Controller Options' (selected), 'DNS Options', 'Additional Options', 'Paths', 'Review Options', and 'Prerequisites Check'. The main area contains the following sections:

- Target Server:** sys1
- Select functional level of the new forest and root domain:**
  - Forest functional level: Windows Server 2003
  - Domain functional level: Windows Server 2003
- Specify domain controller capabilities:**
  - ☒ Domain Name System (DNS) server
  - ☒ Global Catalog (GC)
  - ☐ Read only domain controller (RODC)
- Type the Directory Services Restore Mode (DSRM) password:**
  - Password: [masked with dots]
  - Confirm password: [masked with dots]
- [More about domain controller options](#)

At the bottom, there are buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

16. On DNS Options page, click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window, now on the 'DNS Options' page. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main heading is 'DNS Options'. On the left, the navigation pane lists: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options' (selected), 'Additional Options', 'Paths', 'Review Options', and 'Prerequisites Check'. The main area contains the following sections:

- Target Server:** sys1
- Specify DNS delegation options:**
  - ☐ Create full delegation
- [More about DNS delegation](#)

A yellow warning banner at the top states: 'A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does n... Show more X'. At the bottom, there are buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.



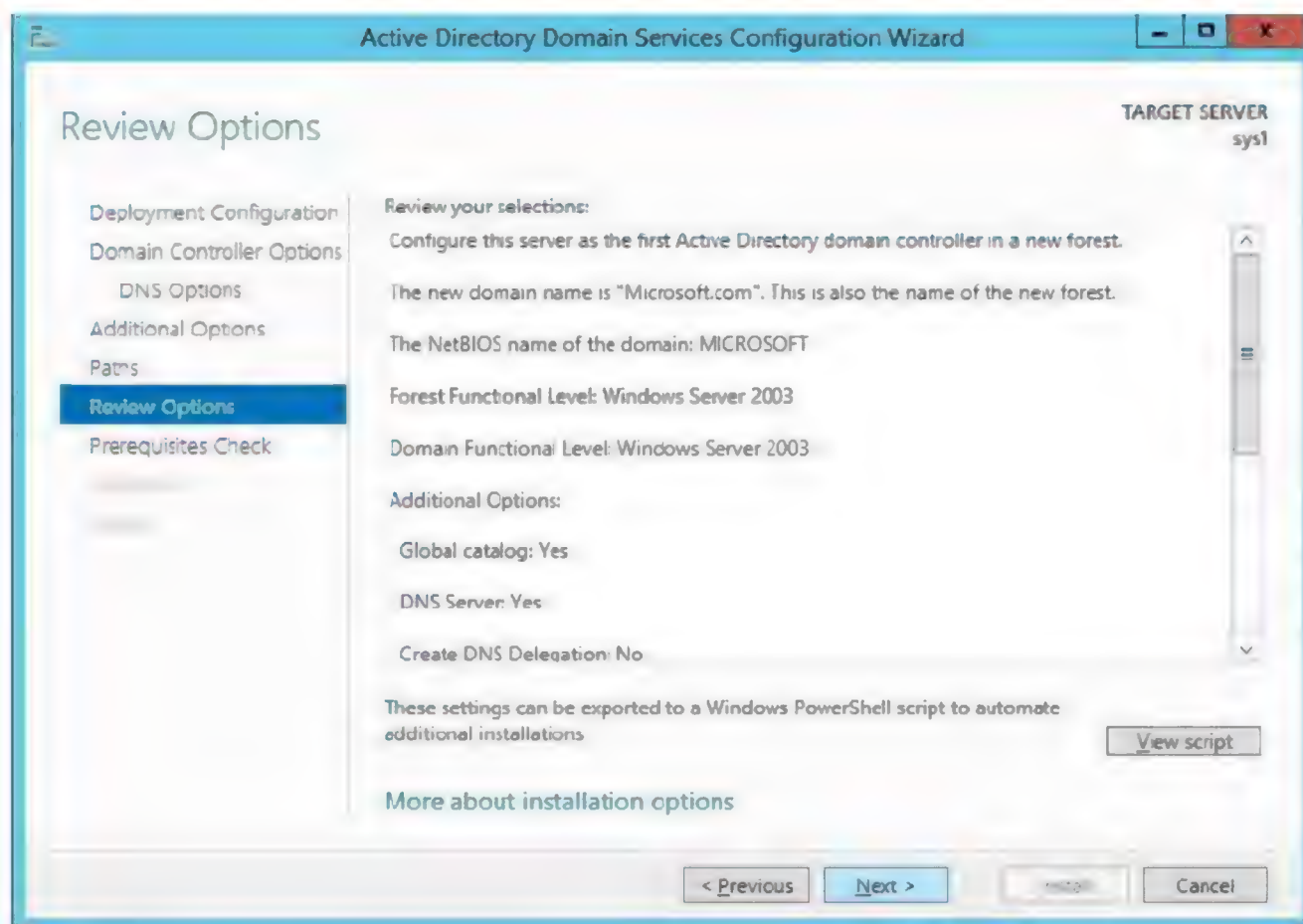
17. Verify the NetBIOS domain name (Ex: MICROSOFT), click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main window has a sidebar on the left with the following options: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options', 'Additional Options' (which is highlighted in blue), 'Paths', 'Review Options', and 'Prerequisites Check'. The main area is titled 'Additional Options' and contains the text 'Verify the NetBIOS name assigned to the domain and change it if necessary'. Below this, it says 'The NetBIOS domain name: MICROSOFT'. In the top right corner, it says 'TARGET SERVER sys1'. At the bottom, there are navigation buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'. A link 'More about additional options' is also present.

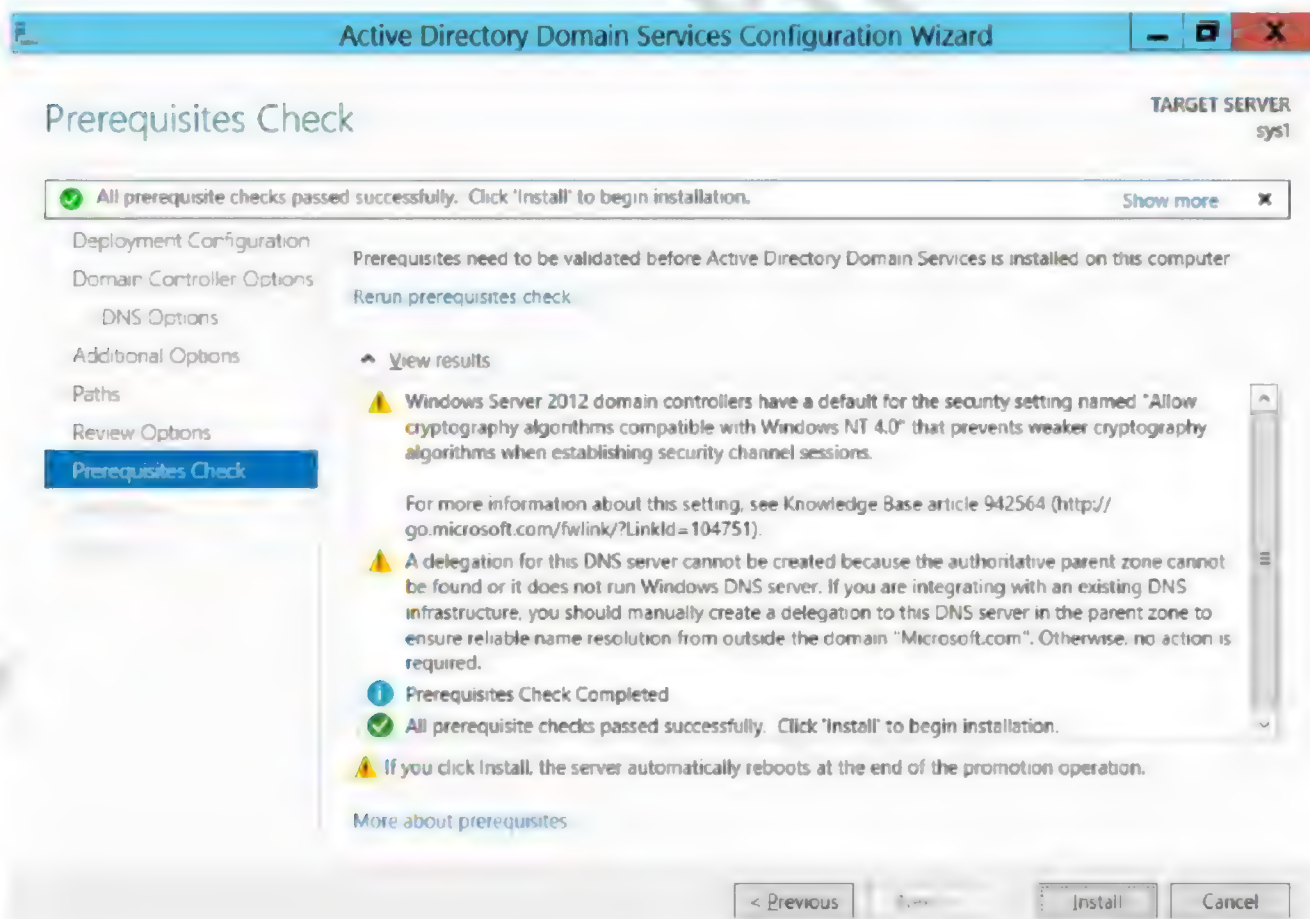
18. Verify the location of the AD DS database, log files, and SYSVOL, click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main window has a sidebar on the left with the following options: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options', 'Additional Options', 'Paths' (which is highlighted in blue), 'Review Options', and 'Prerequisites Check'. The main area is titled 'Paths' and contains the text 'Specify the location of the AD DS database, log files, and SYSVOL'. Below this, there are three rows of configuration: 'Database folder: C:\Windows\NTDS', 'Log files folder: C:\Windows\NTDS', and 'SYSVOL folder: C:\Windows\SYSVOL'. Each row has a browse button to its right. In the top right corner, it says 'TARGET SERVER sys1'. At the bottom, there are navigation buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'. A link 'More about Active Directory paths' is also present.

19. Review the Summary and click **Next**.

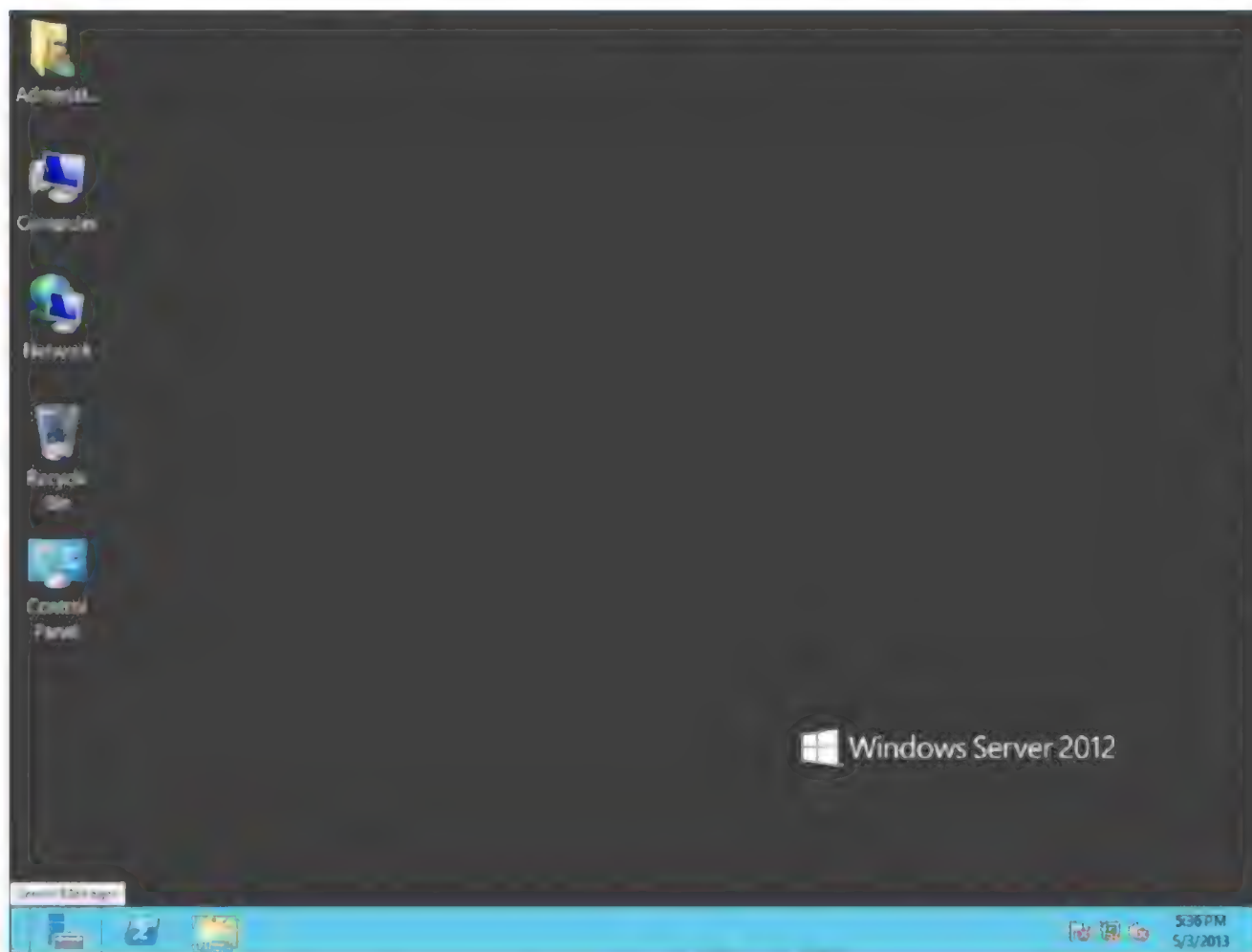


20. Click **Install** to begin installation.

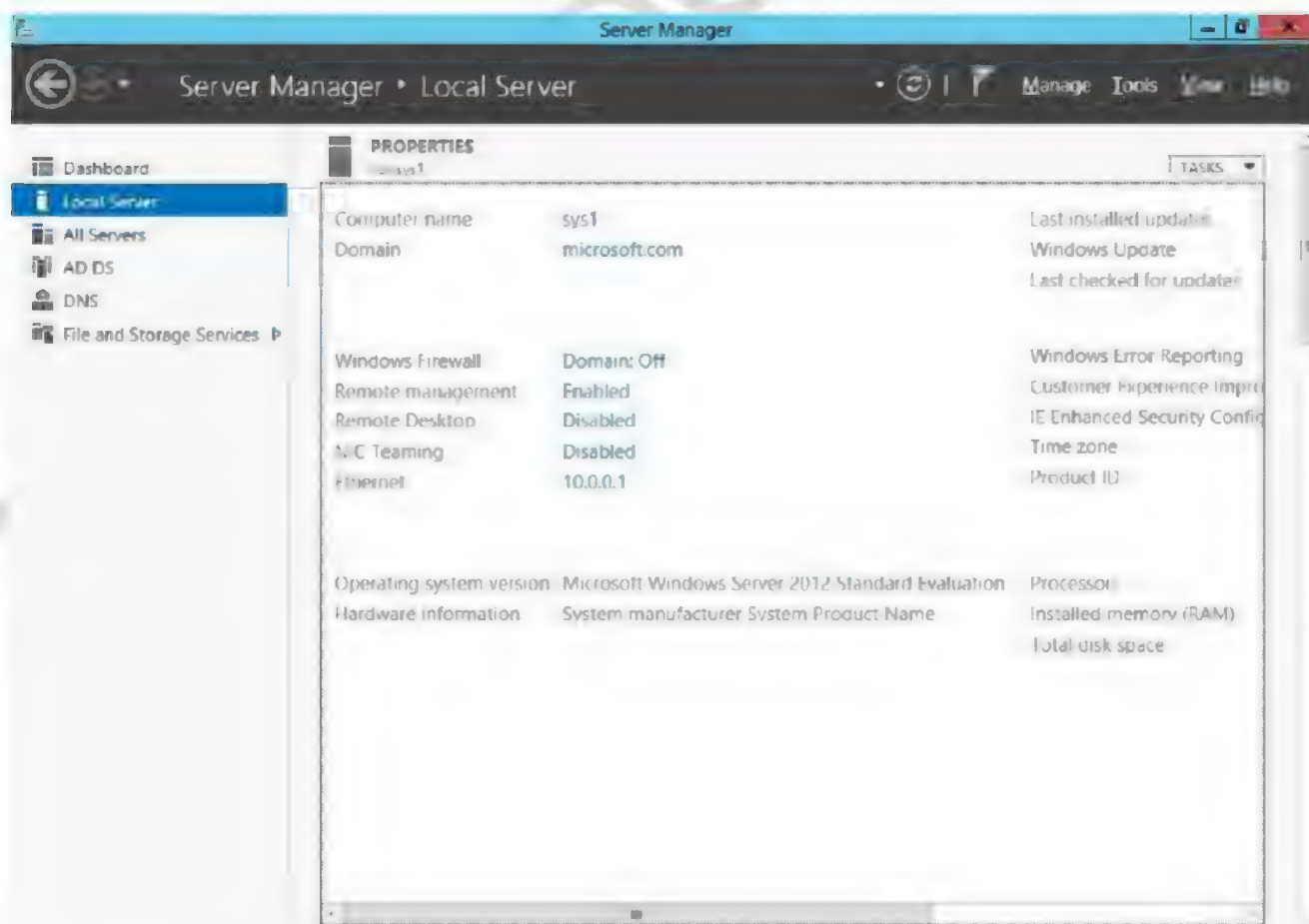


**Verification:**

1. Click **Server Manager**.

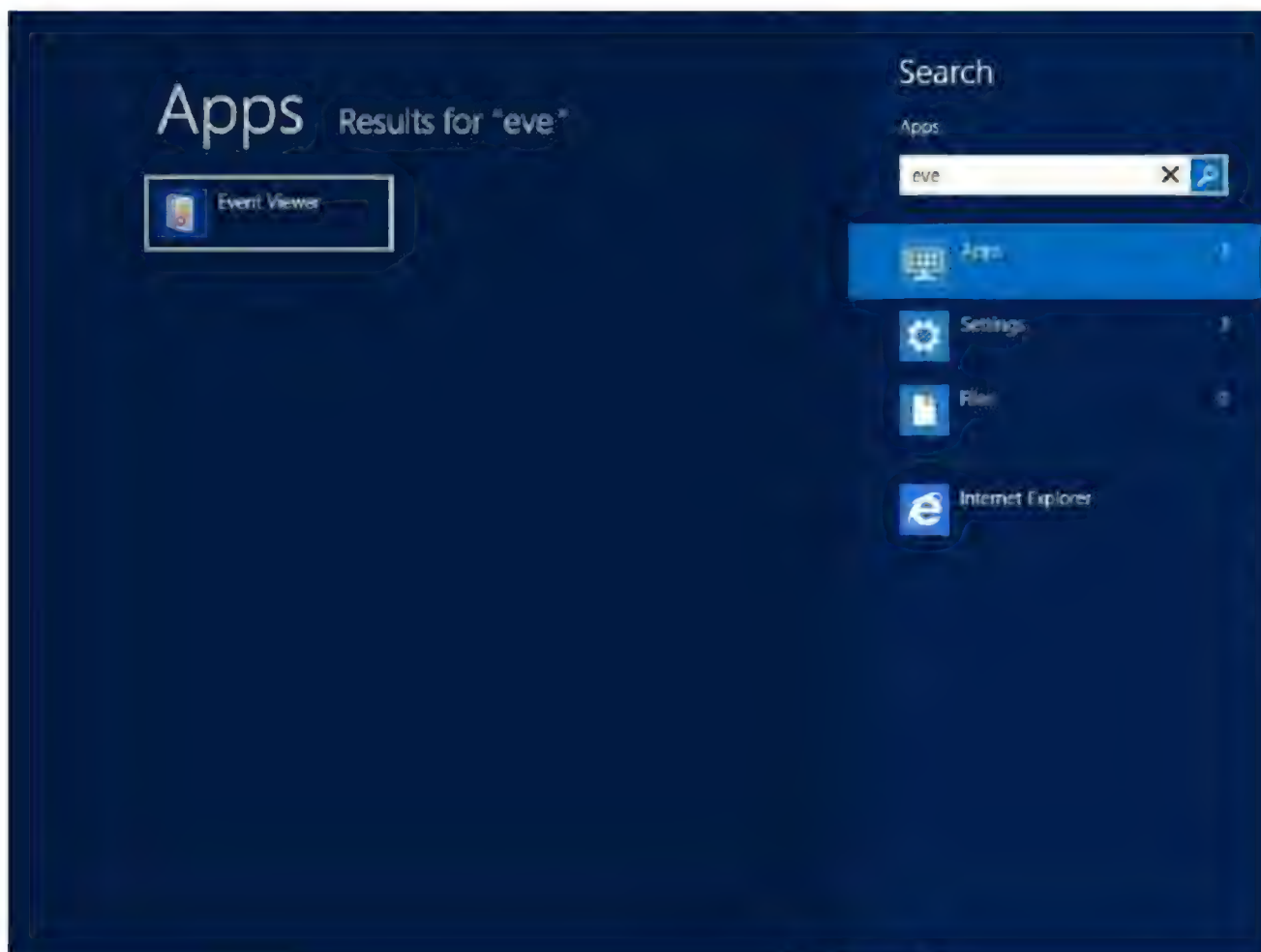


2. In Server manager, select Local Server and verify for domain **Microsoft.com**.

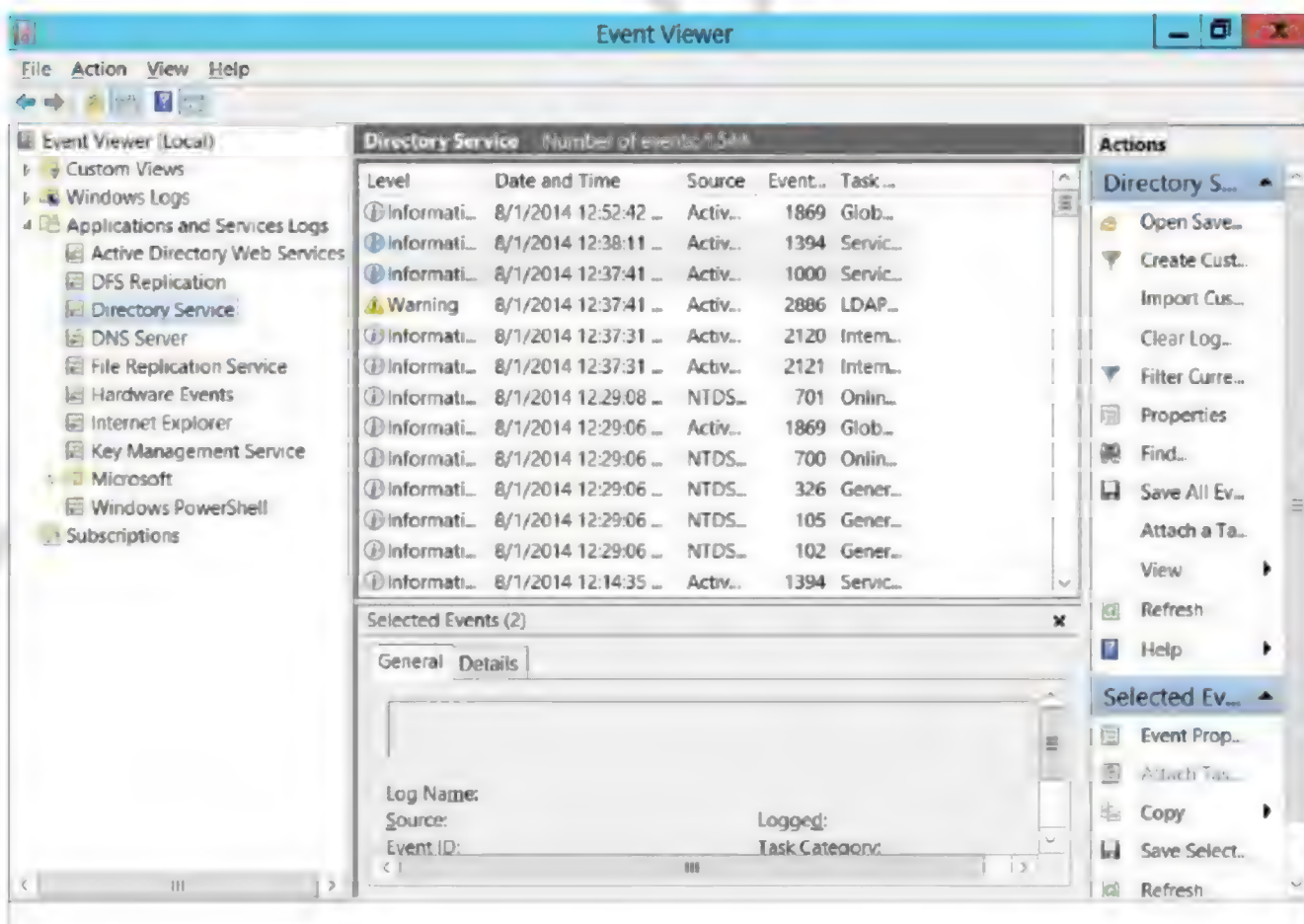




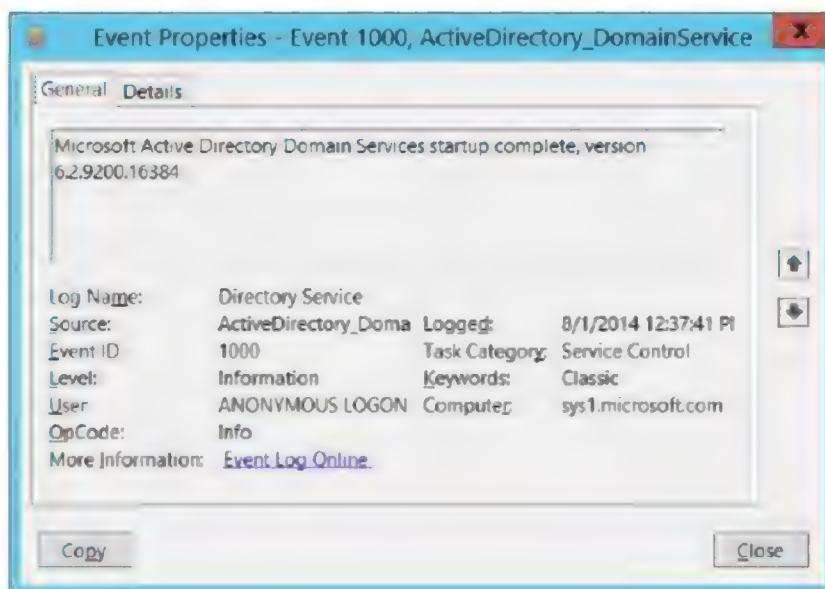
- Go to Start, type event in Search Apps, select **Event Viewer**.



- Expand Applications and Services Logs, select Directory Service, verify for the Event ids 1394 and 1000.



5. Event 1000 displaying Active Directory Domain Services startup complete.



6. Event 1394 displaying Active Directory Domain Services updated successfully.

## Lab – 7: Configuring Client (Windows 7)

### Objective:

To join Clients in Domain

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 7.

### Topology:



#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

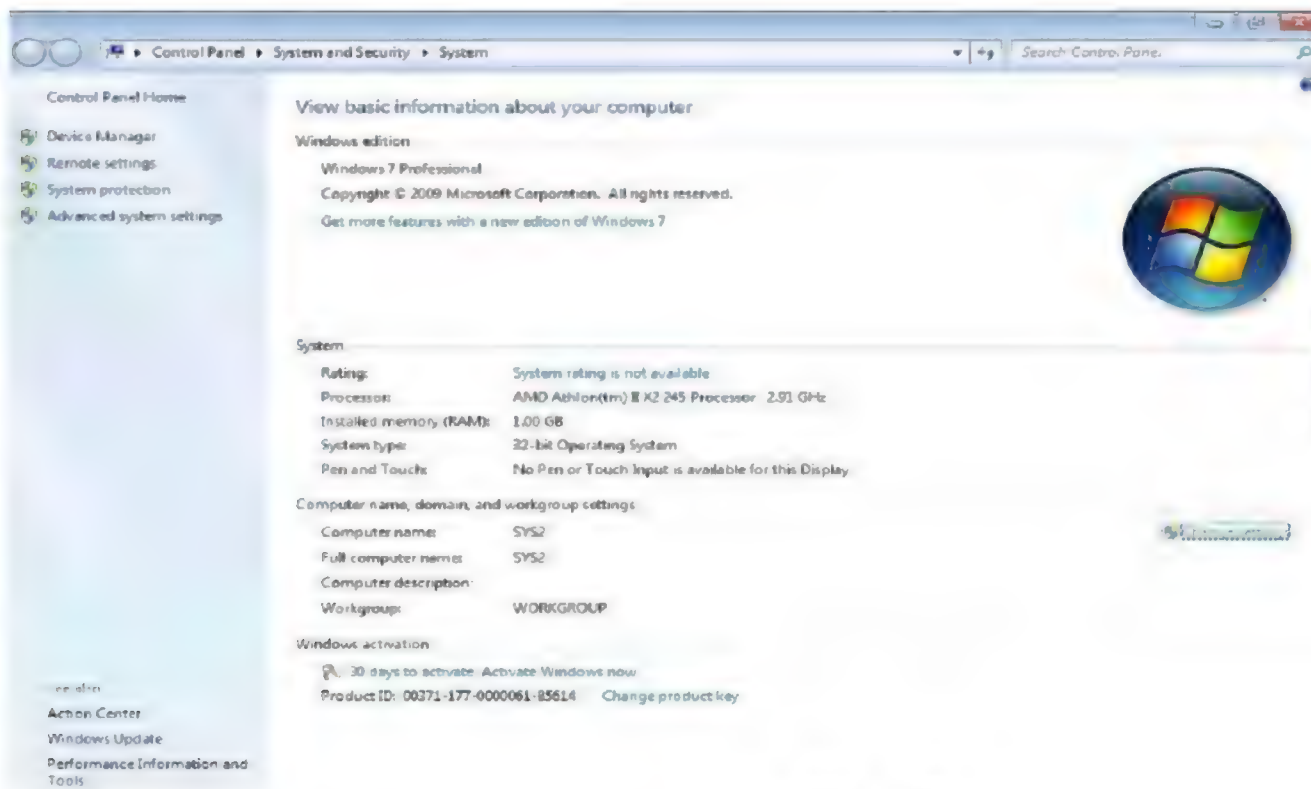
##### workgroup

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

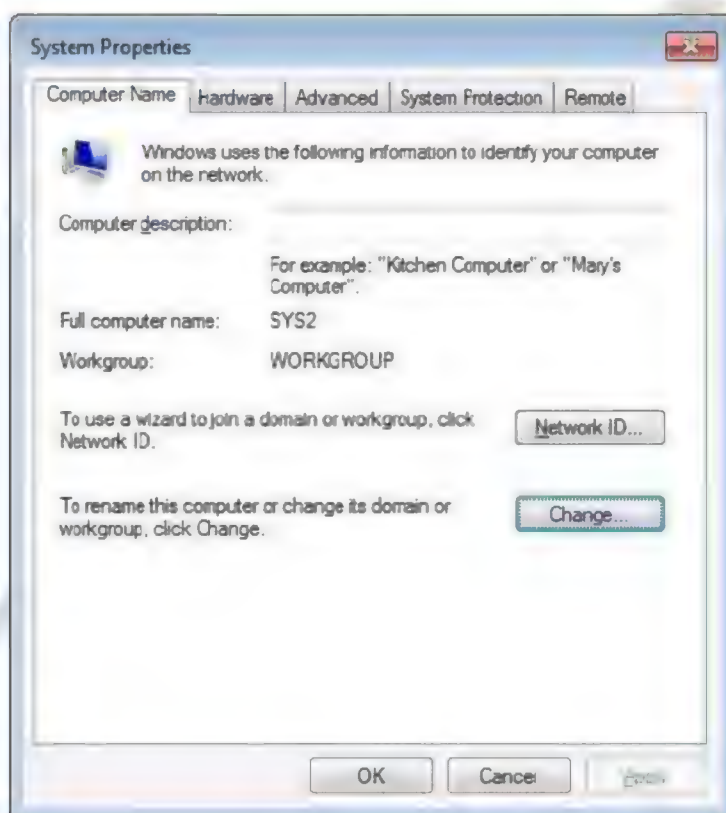


**Steps:**

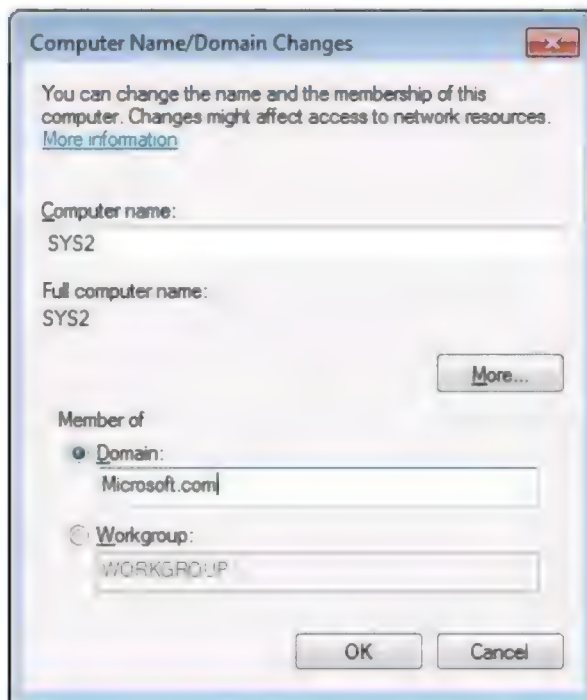
1. Log in as **Administrator** to **Workgroup Computer**.
2. Right click **Computer Icon** and click **Properties** and click **Change settings**.



3. In the System properties dialog box click **Change**.



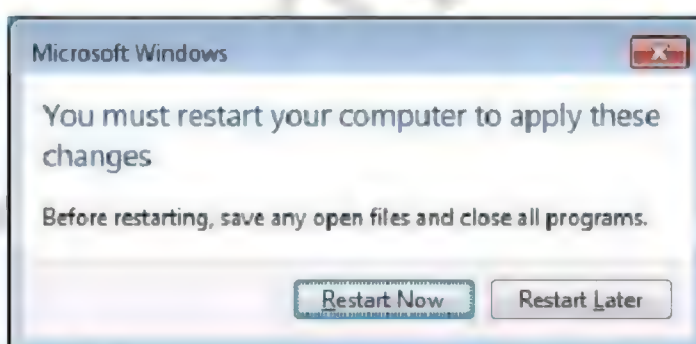
4. Select the Member of **Domain** and enter the Domain Name (Ex: **Microsoft.com**).



5. Enter the user name **Administrator** and **Password**, click **OK**.



6. Welcome Message appears indicating that the computer was successful in joining the Domain, click **OK** and **OK**, It will ask for restart, click **Restart Now**.



7. After restarting the computer, it will become **Client**.

**Verification:**

1. Right click **Computer Icon** → **Properties**.
2. Click Computer Name, domain, and workgroup settings and verify for the Domain Name **MICROSOFT.COM**.

## Lab – 8: Configuring Member server

### Objective:

To join Member Servers in Domain

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server.

### Topology:



#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

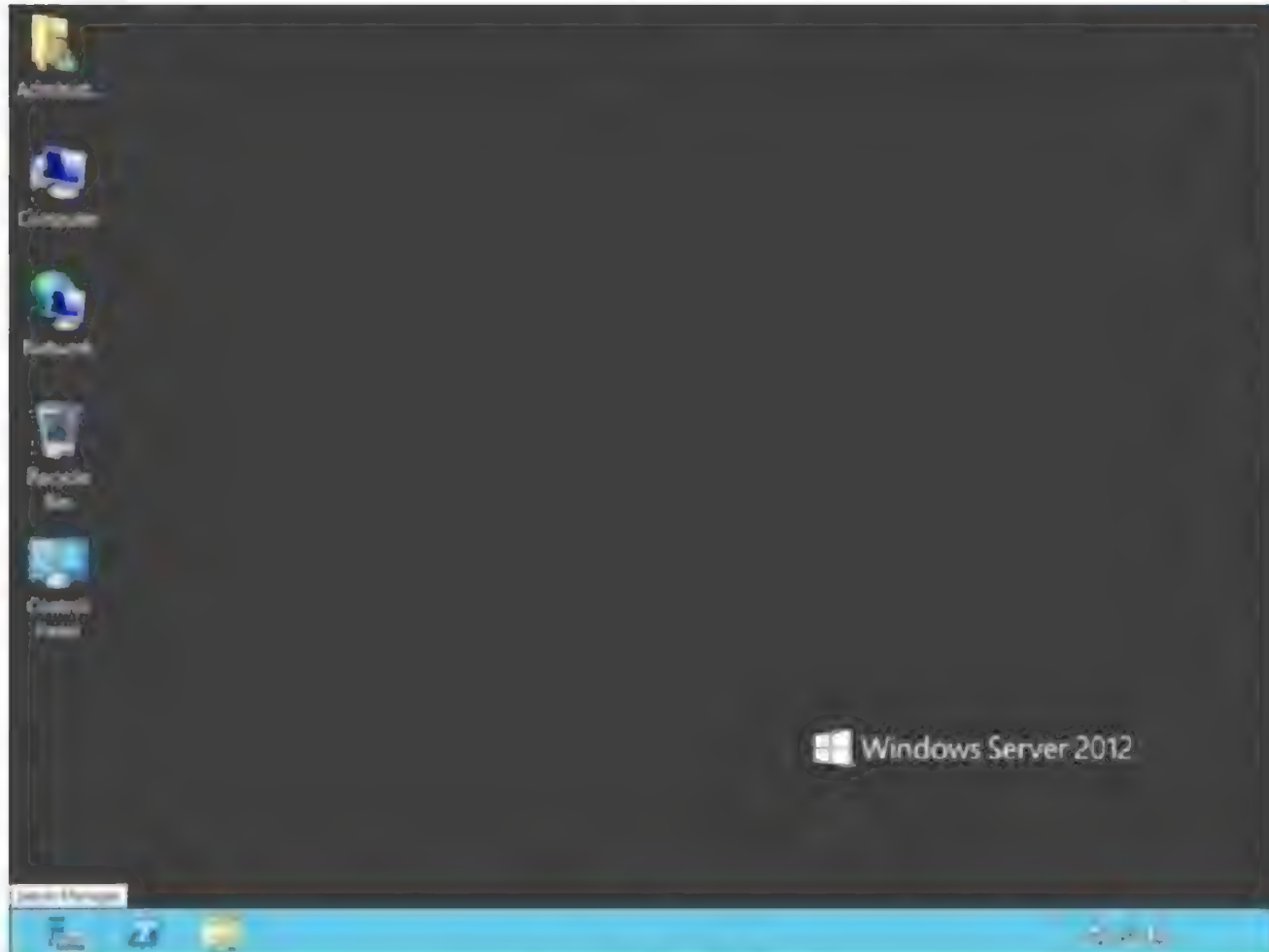
##### workgroup

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

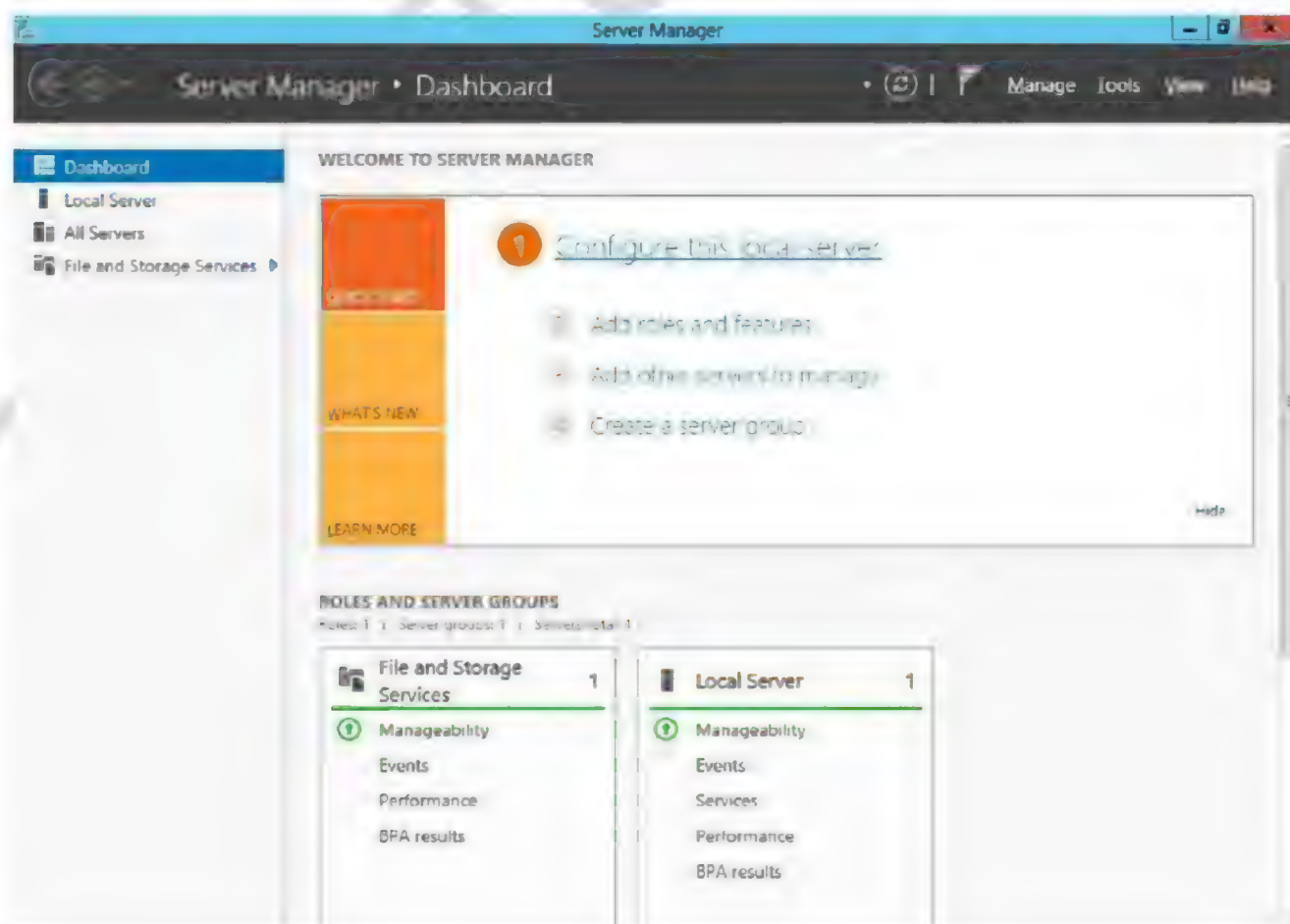


**Steps:**

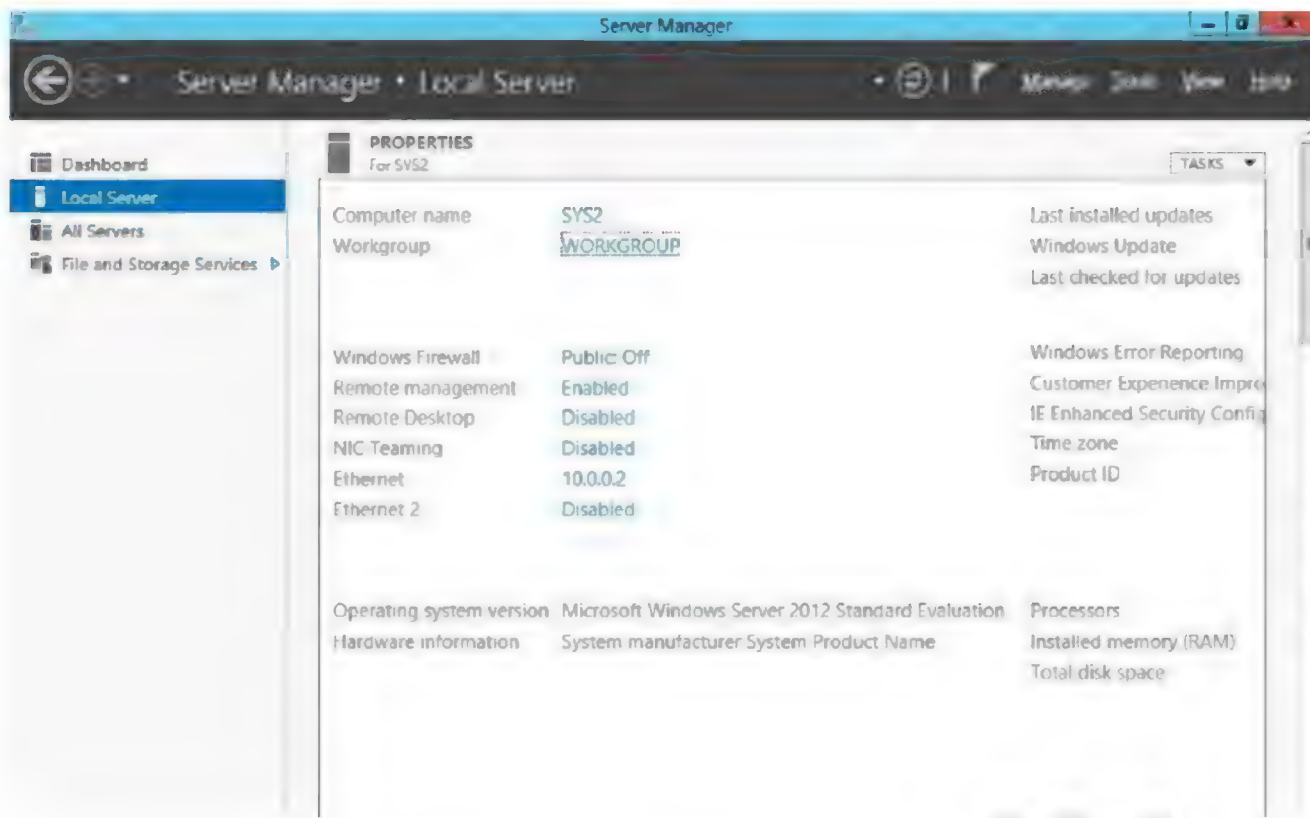
1. Log in as **Administrator** to **Workgroup Computer**.
2. Click **Server Manager**



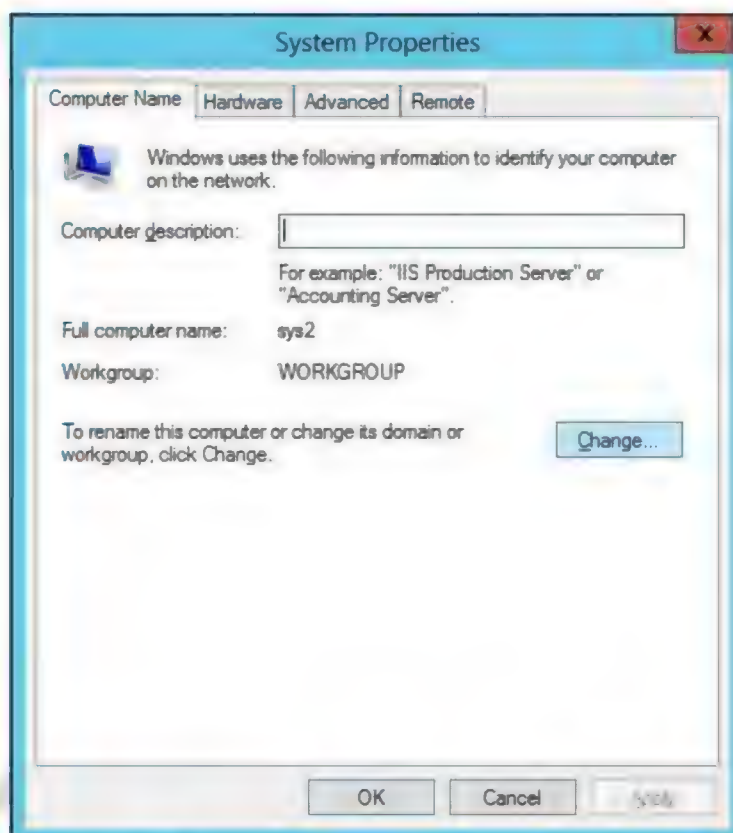
3. In Server Manager Dashboard, Click **Configure this local server**



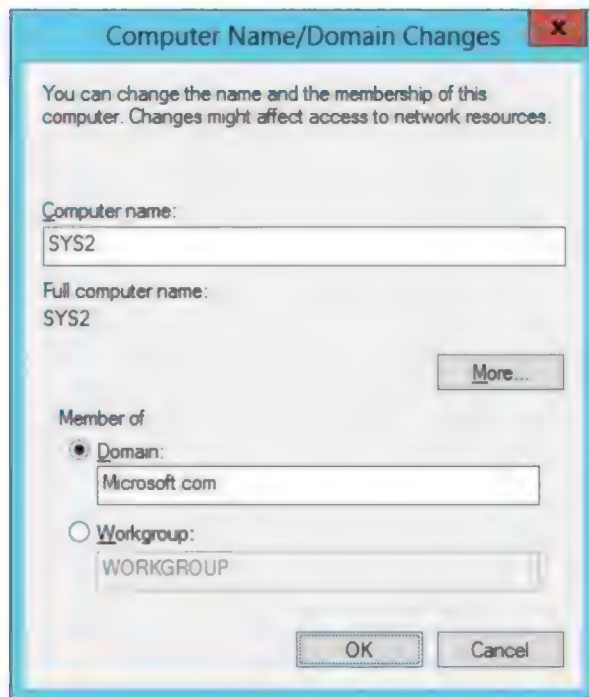
4. In Local Server, select **WORKGROUP**.



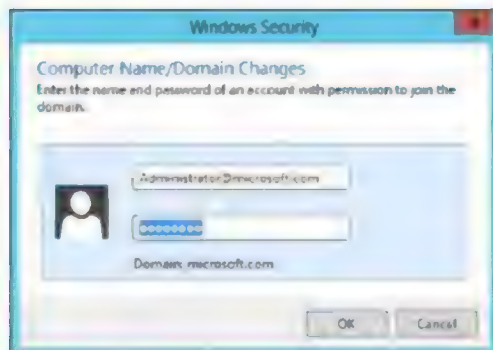
5. In the System properties dialog box click **Change**.



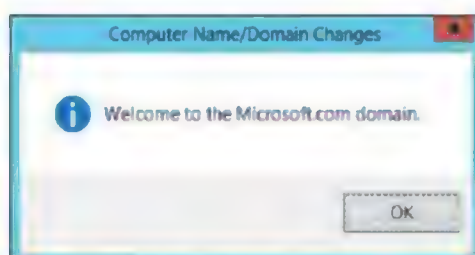
6. Select Member of **DOMAIN** and enter the Domain Name.(Ex:Microsoft.com)



7. Enter the user name **Administrator** and **Password**. Click **OK**.



8. Welcome Message appears indicating that the computer was successful in joining the Domain, click **OK**.



9. Click **OK** → click **OK**, and click **Close** to close the System Properties dialog box. It will ask for restart, click **Yes**.
10. After restarting the computer it will become **Member Server**.

**Verification:**

1. Go to Server Manager, select Local Server.
2. Verify for the Domain **MICROSOFT.COM**.



## Lab – 9: Creating Domain User Accounts

### Objective:

To create Domain Users in Active directory Domain controller

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

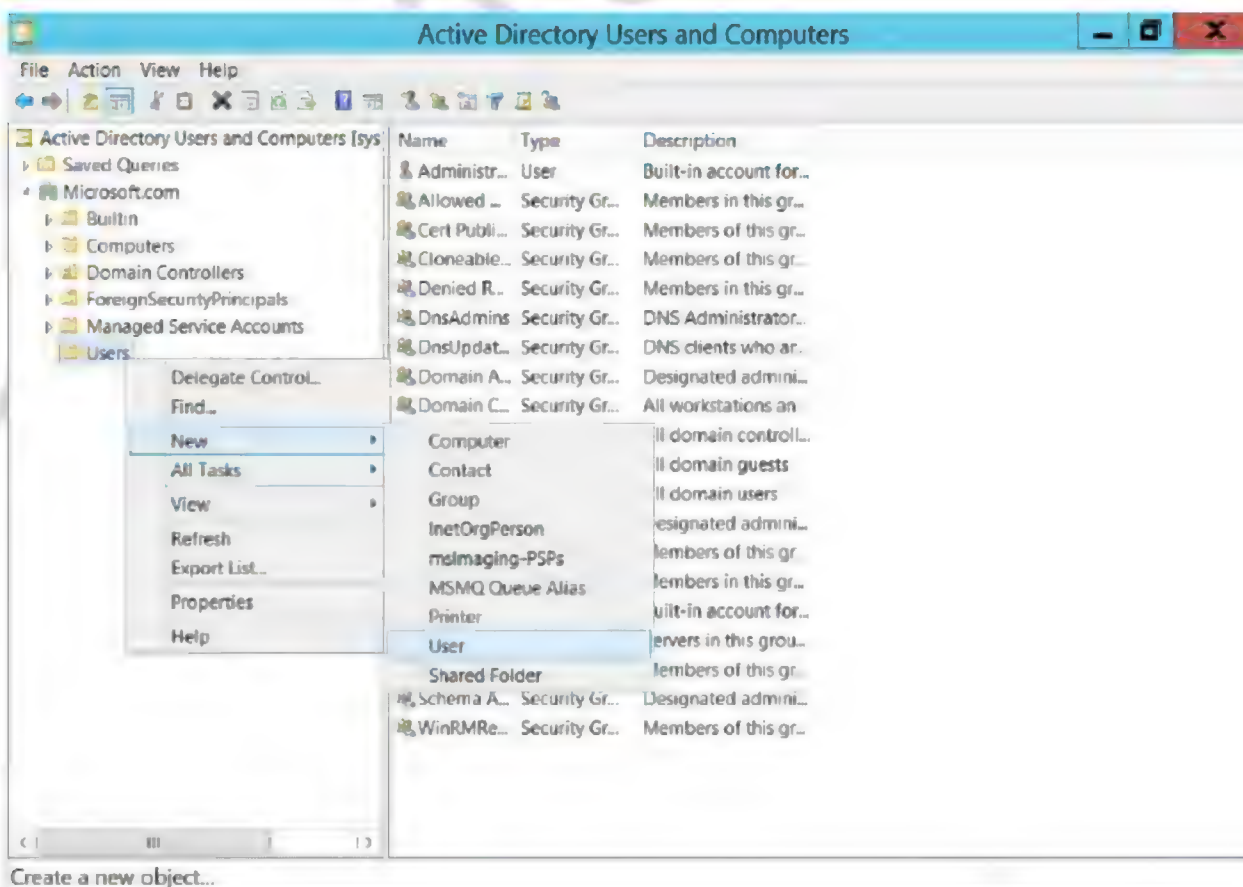
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Log in as **Administrator** to the **Domain Controller**.
2. Press Windows Key to go to Start, select **Active Directory User and Computers**.



3. In the console tree, expand your domain **MICROSOFT.COM**, and then right click **Users** Container, select **New User**.



4. Specify the **First name** and **User Logon name** and then click **Next**.

5. Enter the **Password** and **Confirm Password** for the User account, click **Next**.

6. Review the configuration settings for the User Account and then click **Finish**.

**Verification:**

1. Login as User (**User1@Microsoft.com**) in Member Server or Client.





## Lab – 10: Changing Default Password Policy

### Objective:

To change default password policies

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

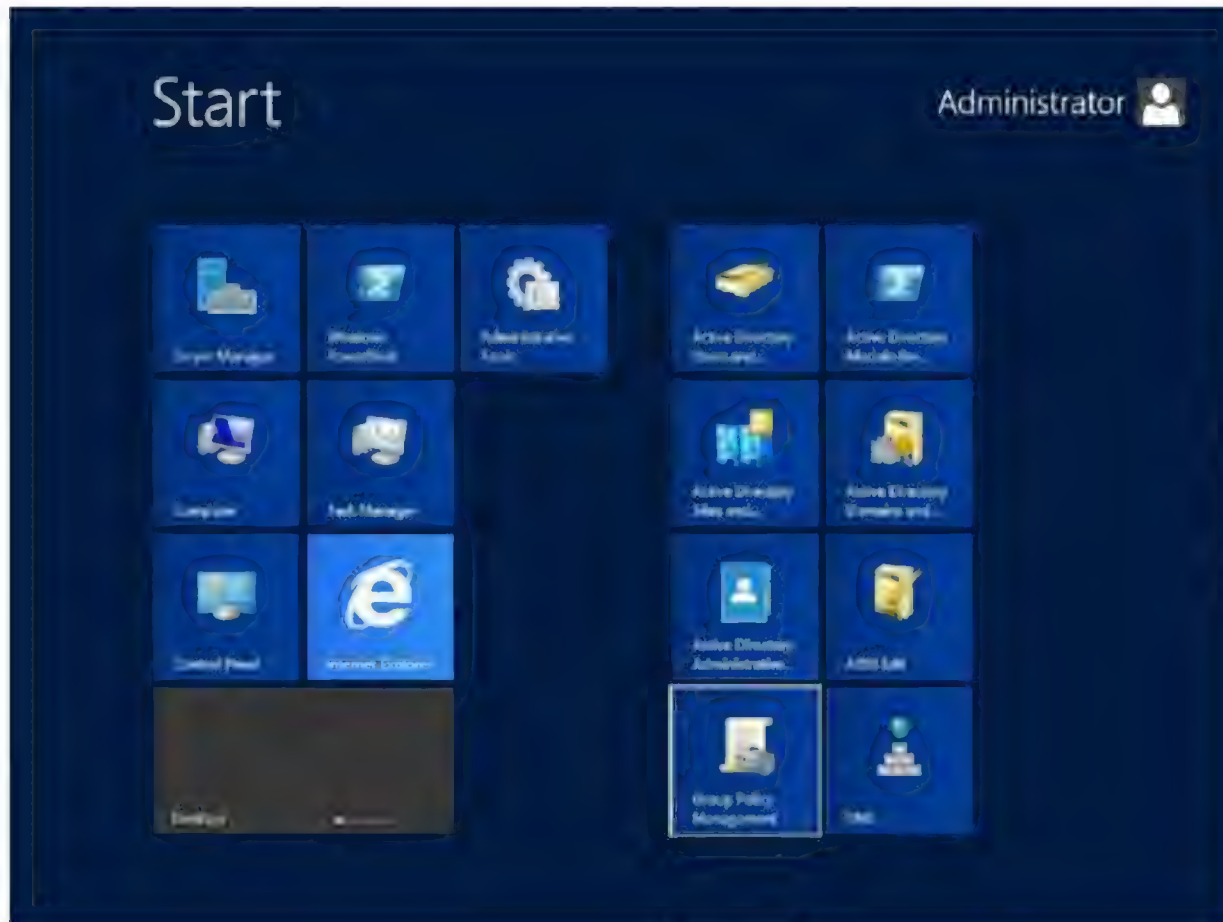
#### SYS2

##### Member Server / Client

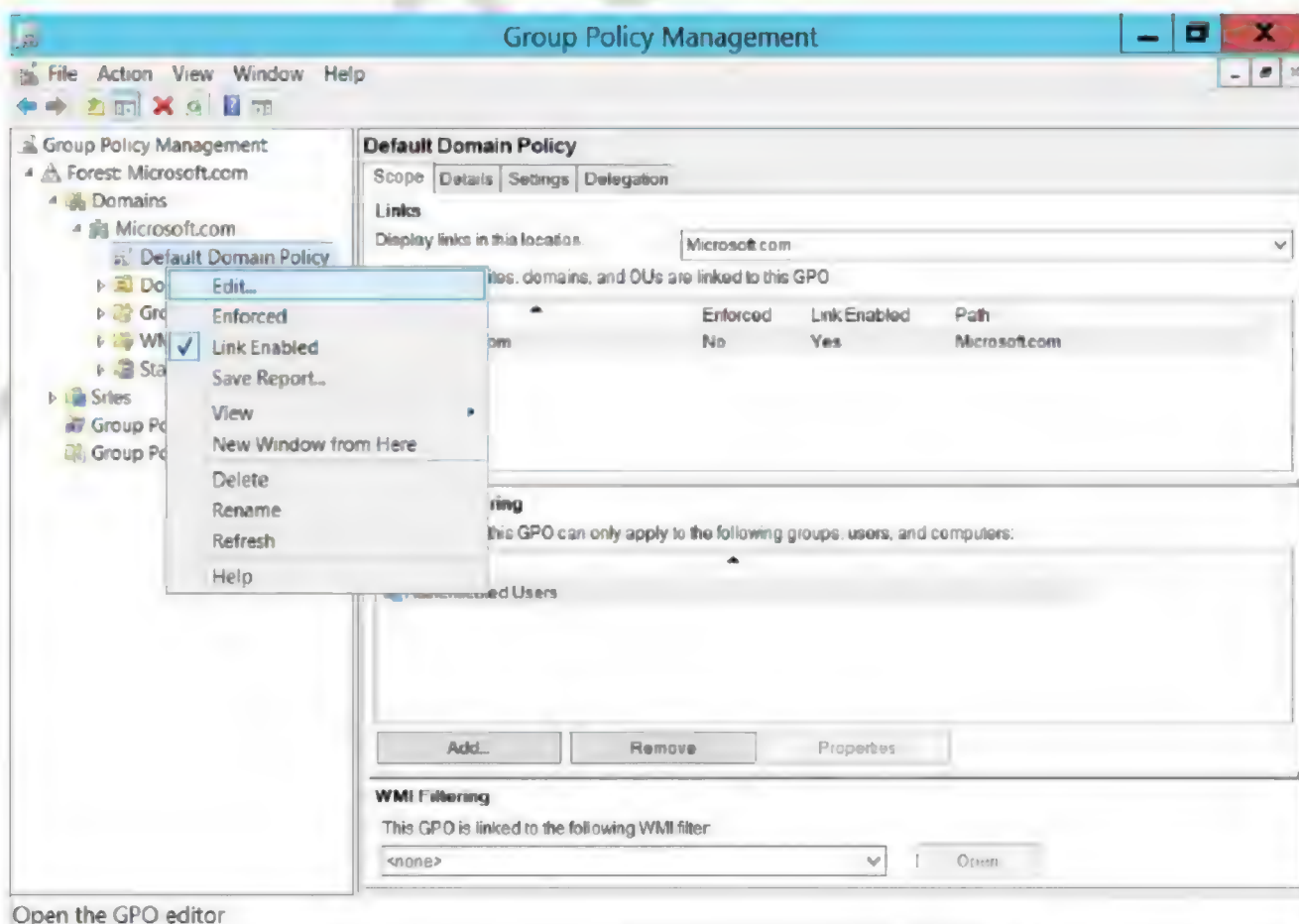
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

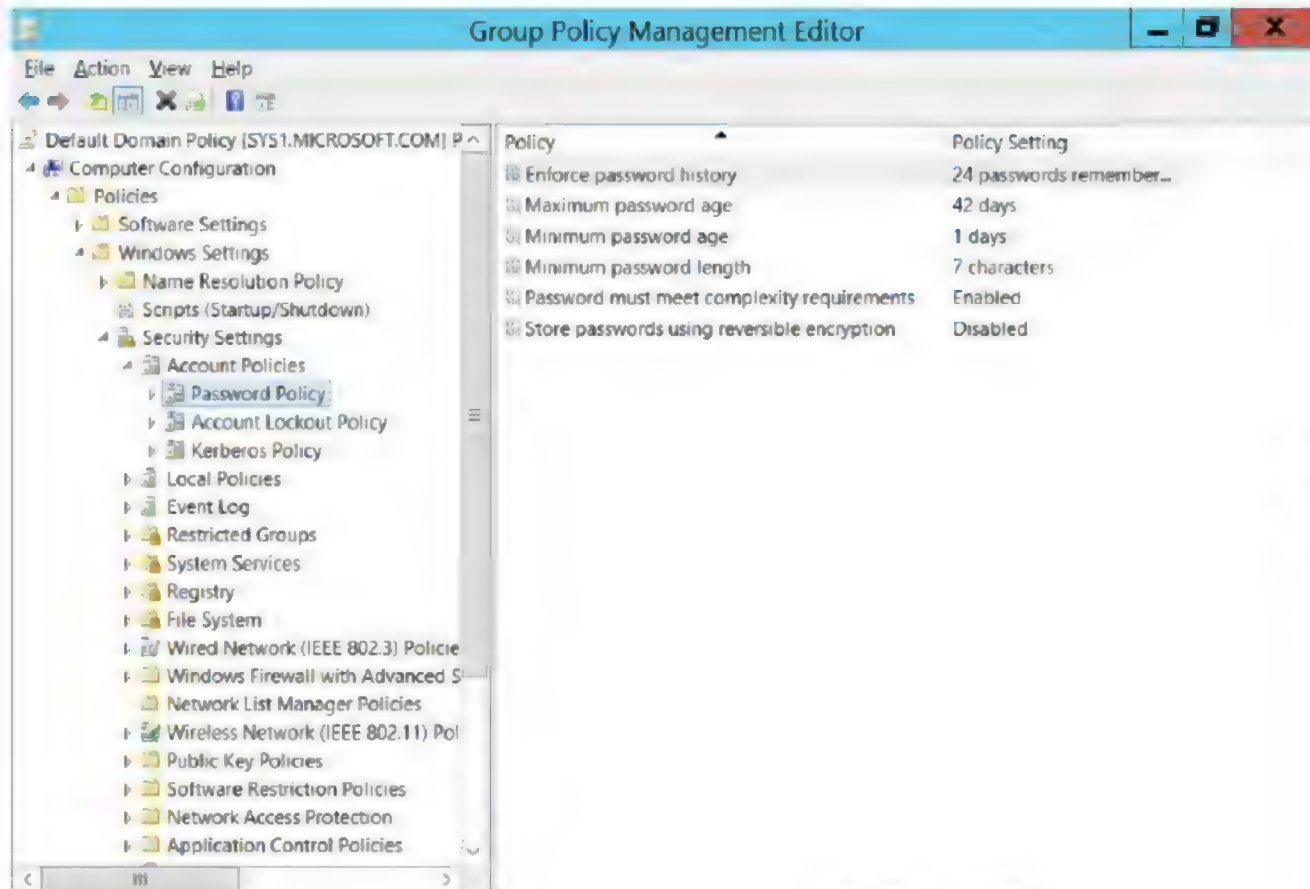
1. Log in as **Administrator** to the **Domain Controller**.
2. Press Windows Key to go to Start, select **Group Policy Management**.



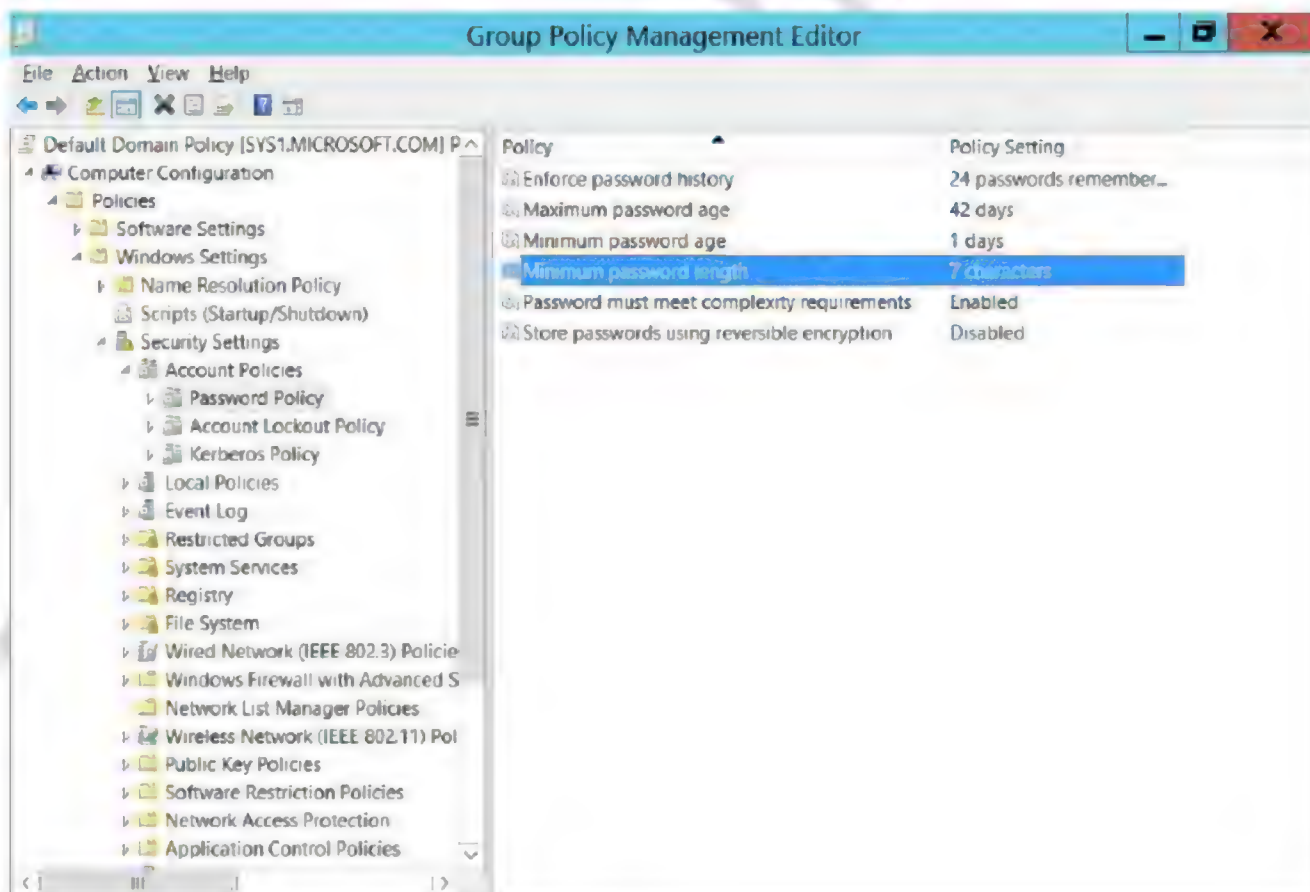
3. Expand Forest → Expand Domains → Expand Microsoft.com → right click **Default Domain policy** and select **Edit**.



4. Expand **Computer Configuration** → Expand **Policies** → Expand **Windows Settings** → Expand **Security Settings** → Expand **Account Policies** → Open **Password Policy**.

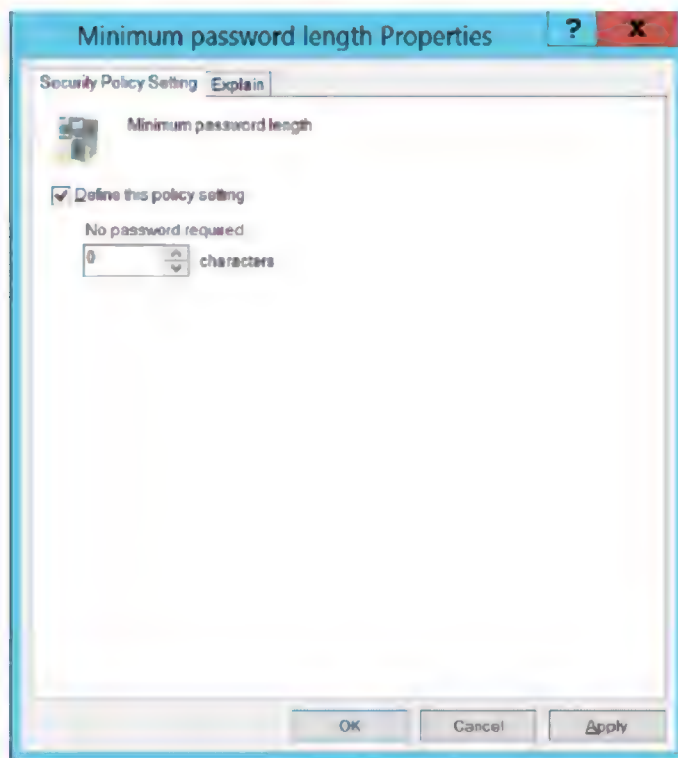


5. Double click **Minimum Password Length**.

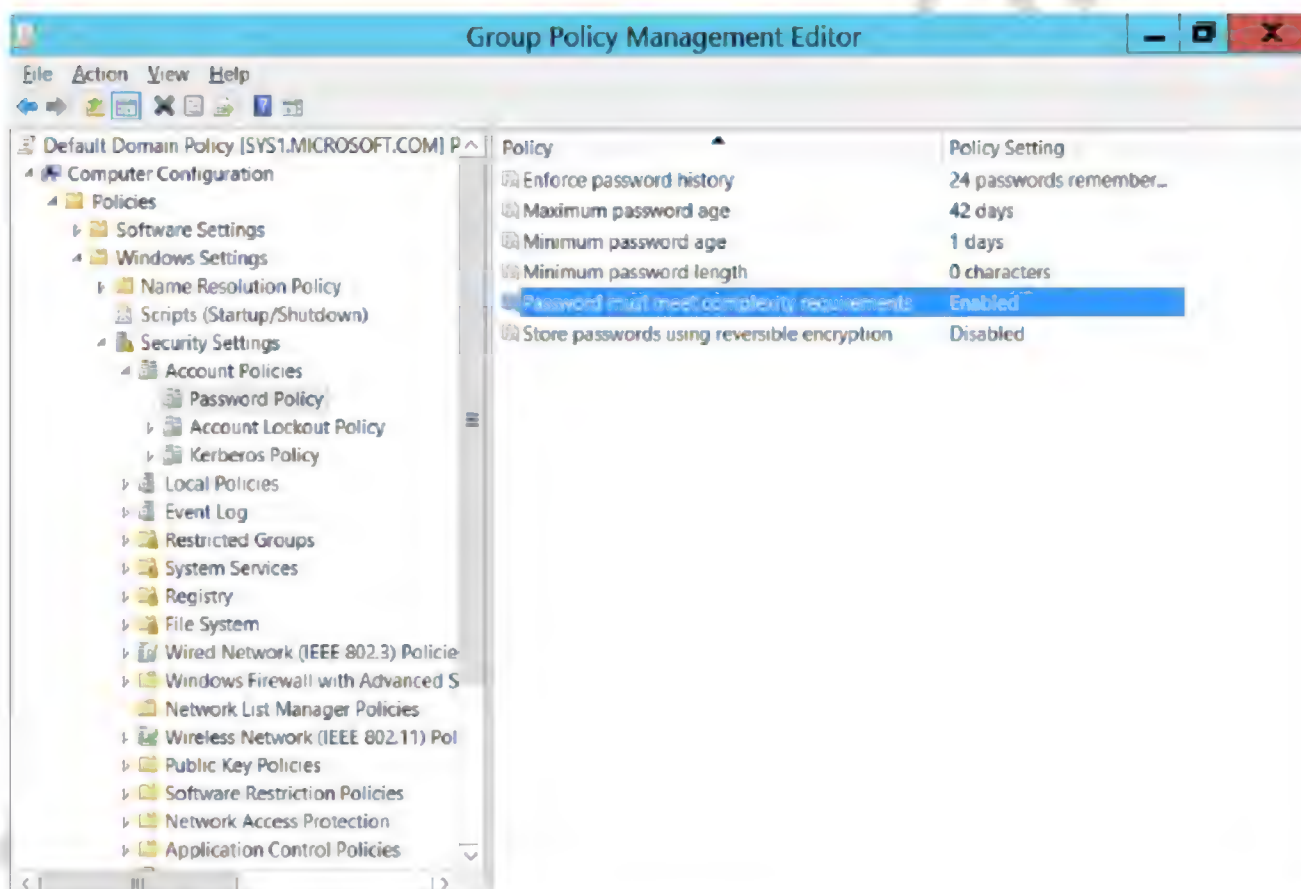




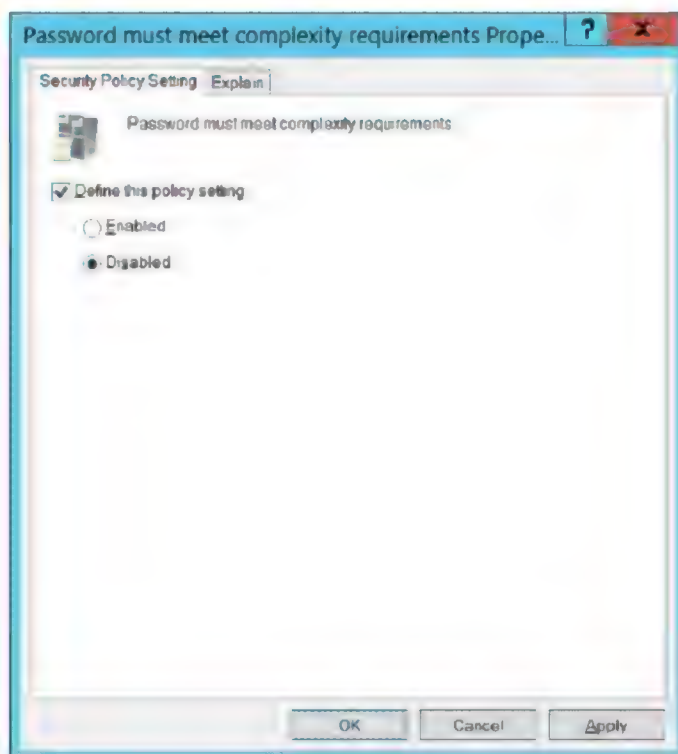
6. Change the length value from (7 to 0) and click **Apply** and **OK**.



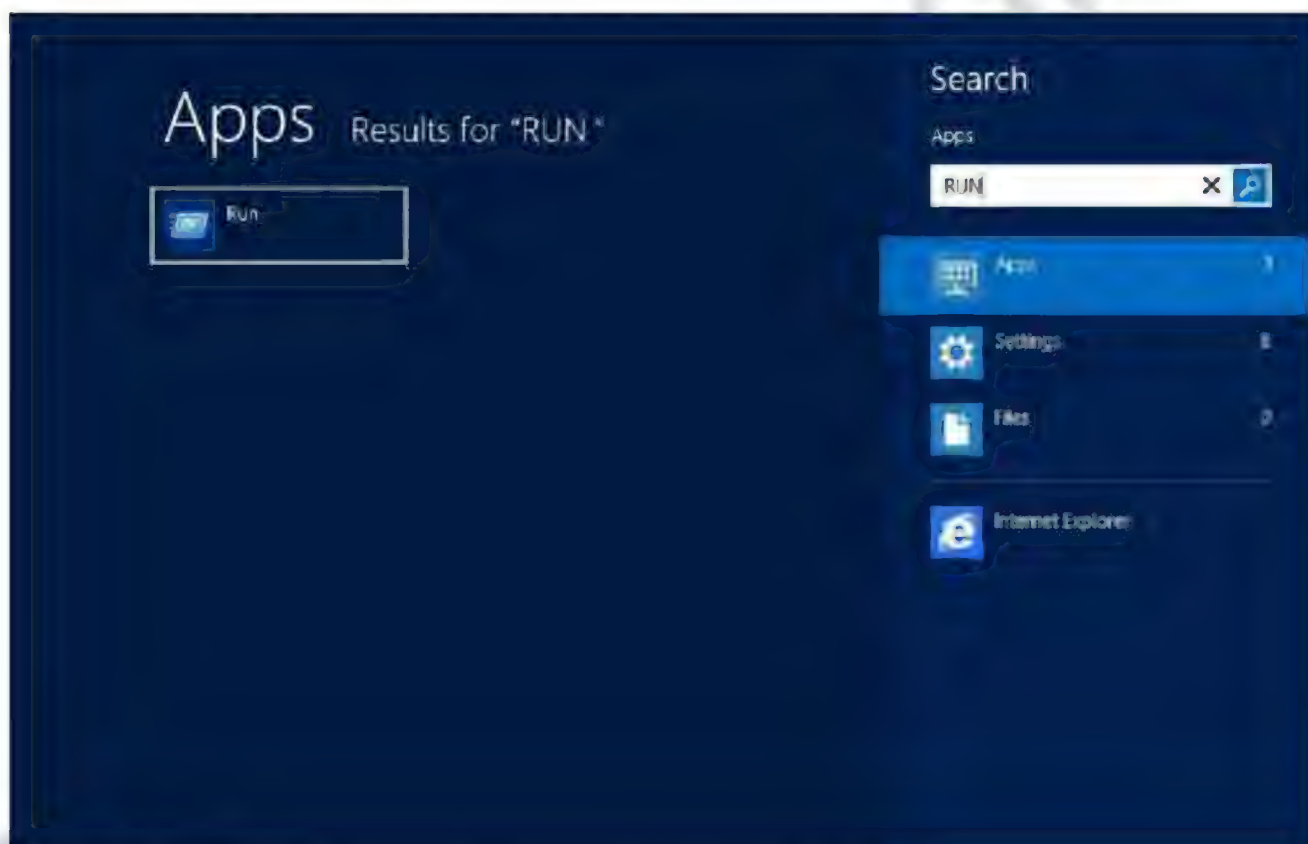
7. Double click **Password must meet complexity Requirements**.



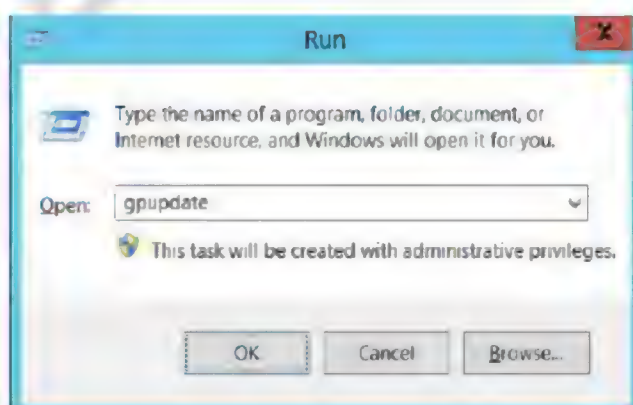
8. Select **Disabled** and **Apply** and **OK**.



9. Go to Start, type Run in Search Apps, and select **Run**



10. Type **GPUPDATE** and It refreshes the policy changes.



## Lab – 11: Enabling Account Lockout Policy

### Objective:

To Configure Account Lockout Policies

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

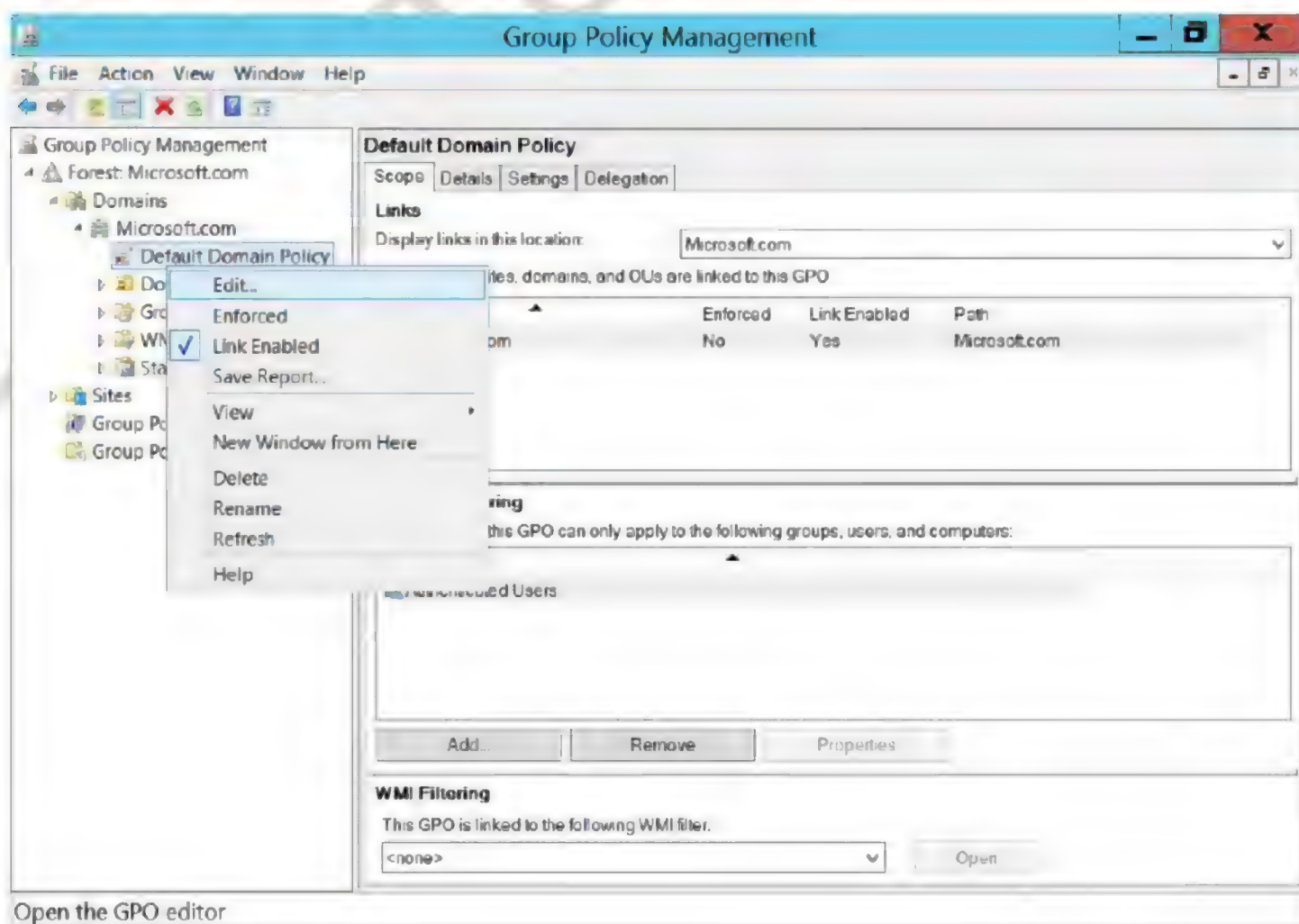


**Steps:**

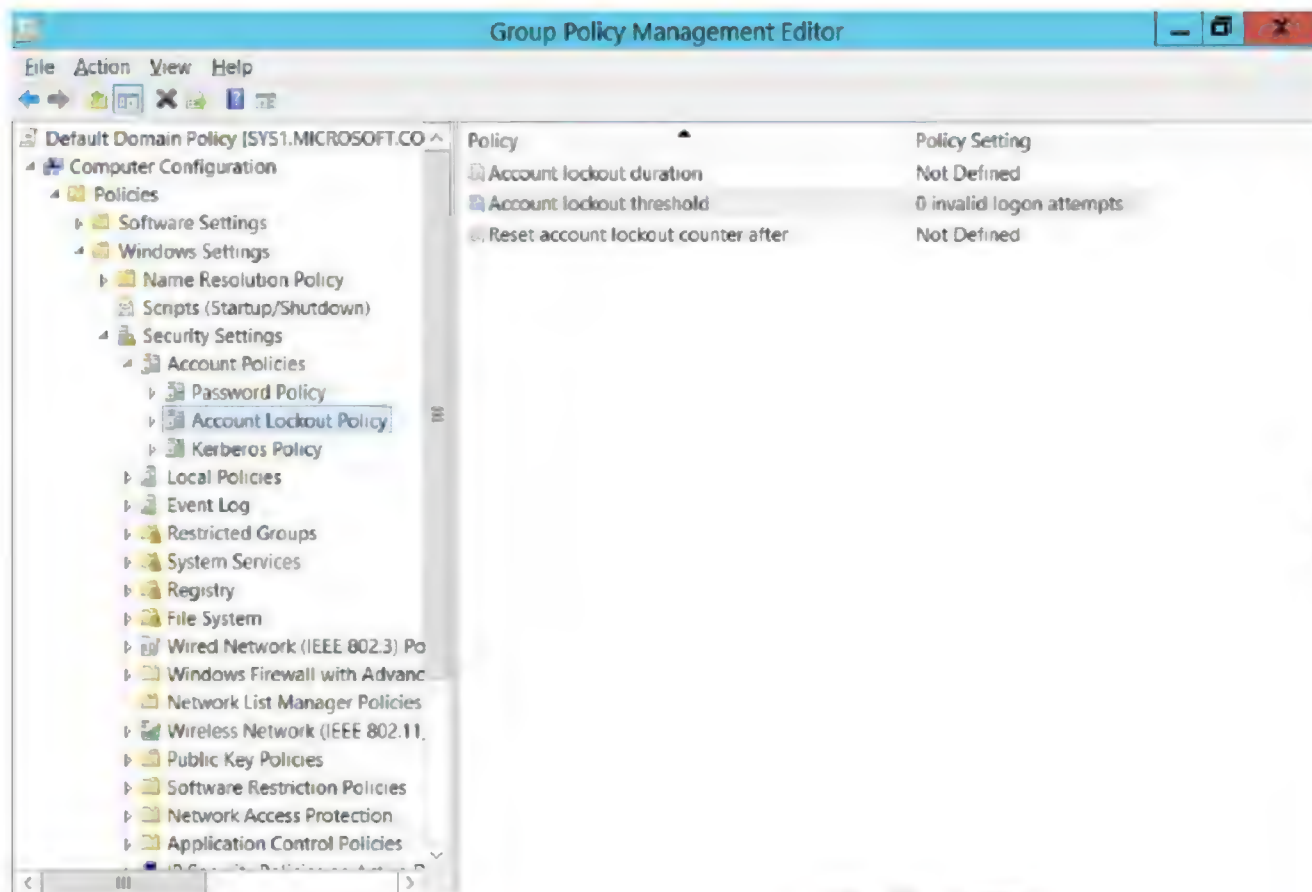
1. Log on to D.C as Administrator, click Press Windows Key to go to Start, select **Group Policy Management**.



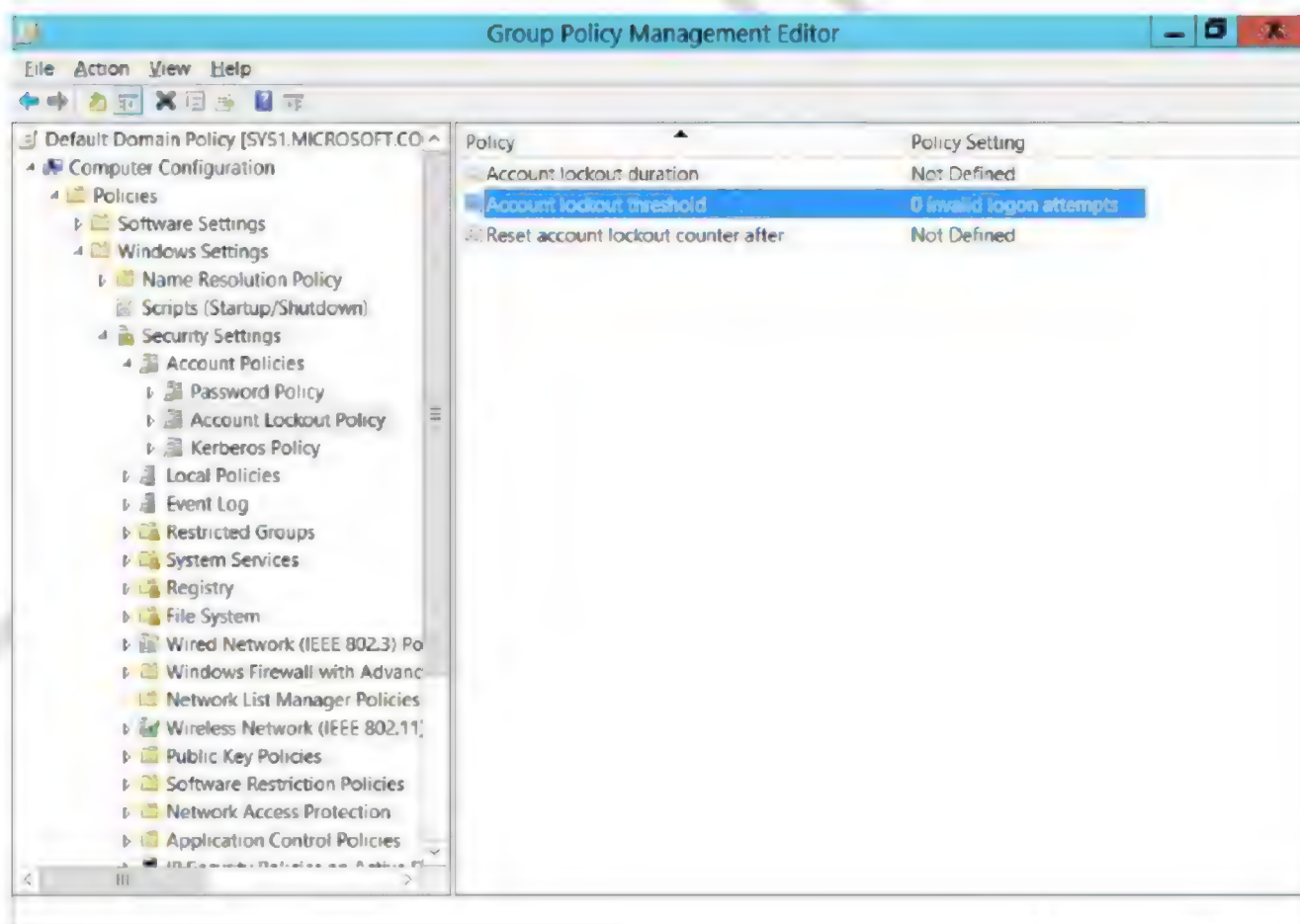
2. Expand **Forest** → Expand **Domains** → Expand **Microsoft.com** → right click **Default Domain policy** and select **Edit**.



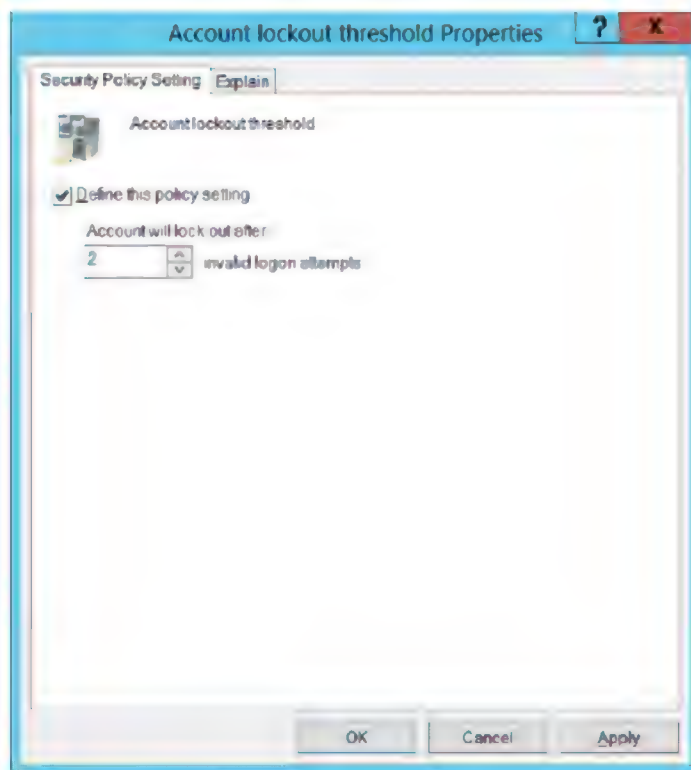
3. Expand **Computer Configuration** → Expand **Policies** → Expand **Windows Settings** → Expand **Security Settings** → Expand **Account Policies** → Open **Account Lockout Policy**.



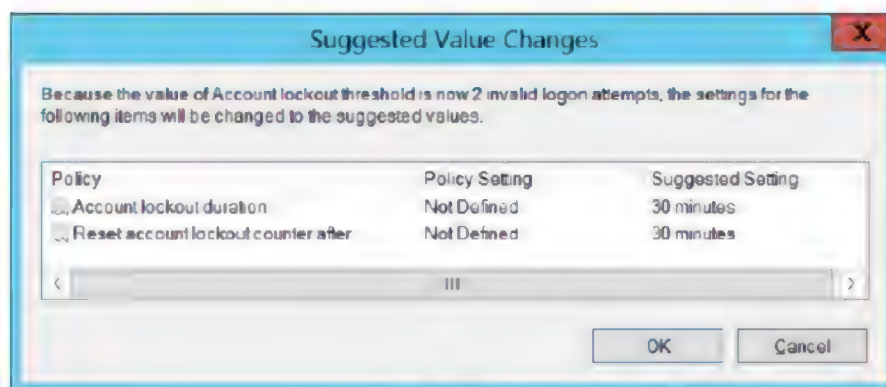
4. Double click, **Account lockout threshold**.



5. Enter the Value for Number of **invalid logon attempts**(Ex: 2)



6. Set the **Account lockout duration** and click **OK**.



7. Close the **Group Policy Management** Window.

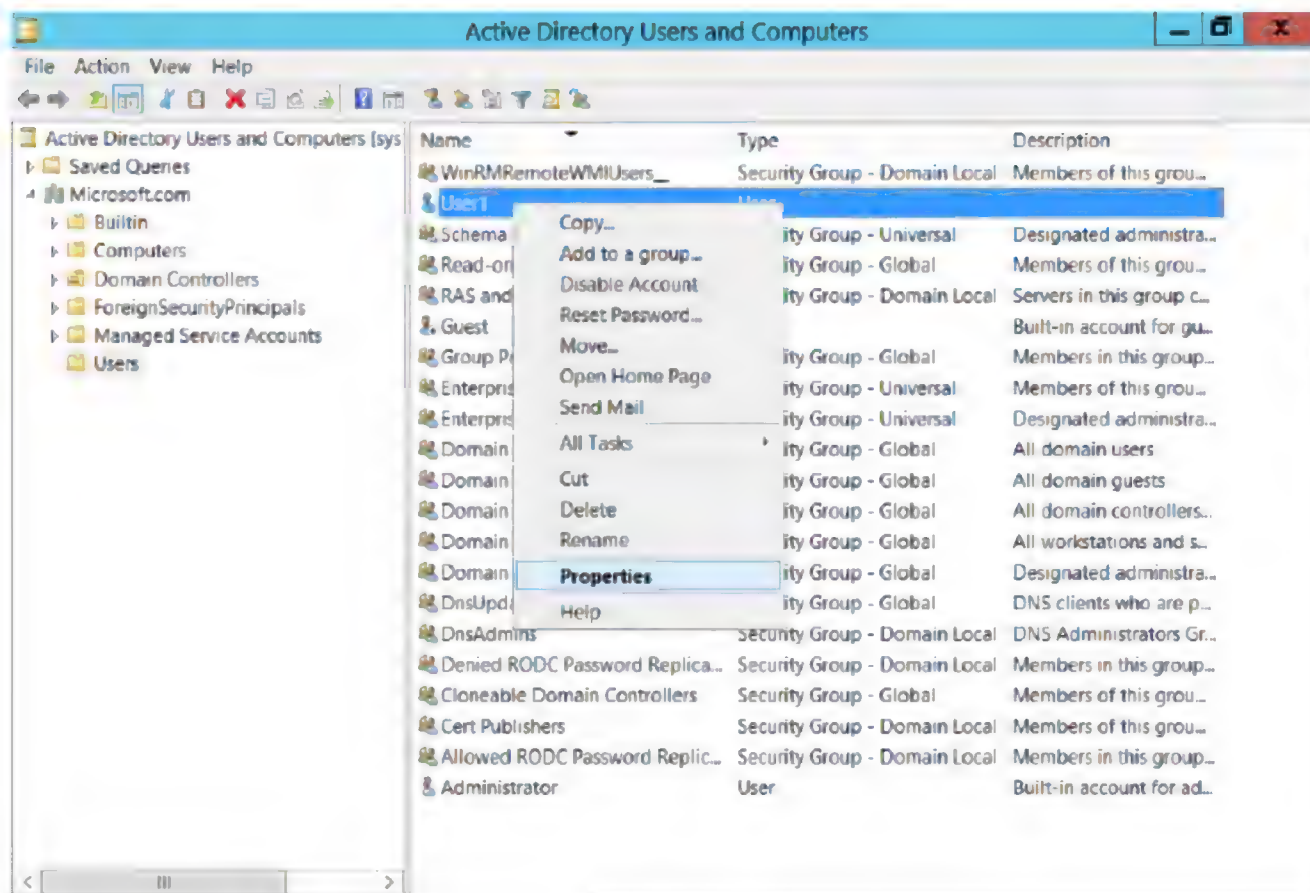
### **Verification:**

1. Enter the password for **user (User1)** wrongly for 2 times while logging in and the user account will be locked.



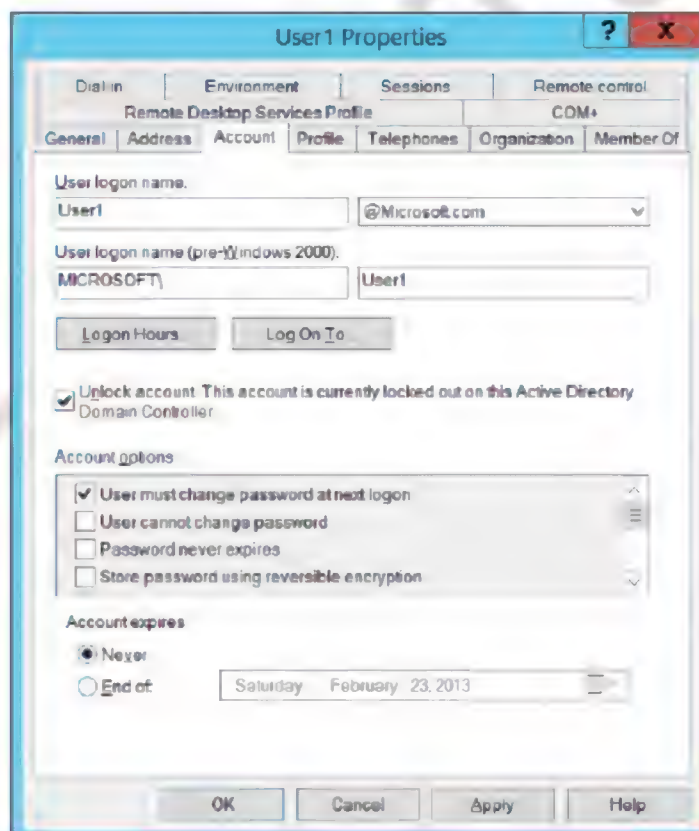
## Unlocking the locked User Account Manually

1. Log on to D.C as Administrator, click Start → Programs → Administrative Tools → **Active Directory Users and Computers**.
2. Right click the User (**User1**) and select **Properties**.



Opens the properties dialog box for the current selection.

3. Check the box **Unlock account** → click **Apply** and **OK**.



### Verification:

Log in as User (**User1**) in client or Member Server.

## Lab – 12: Configuring Logon to and Logon hours permissions

### Objective:

To place time and machine restrictions on a user using Logon to and Logon hours

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

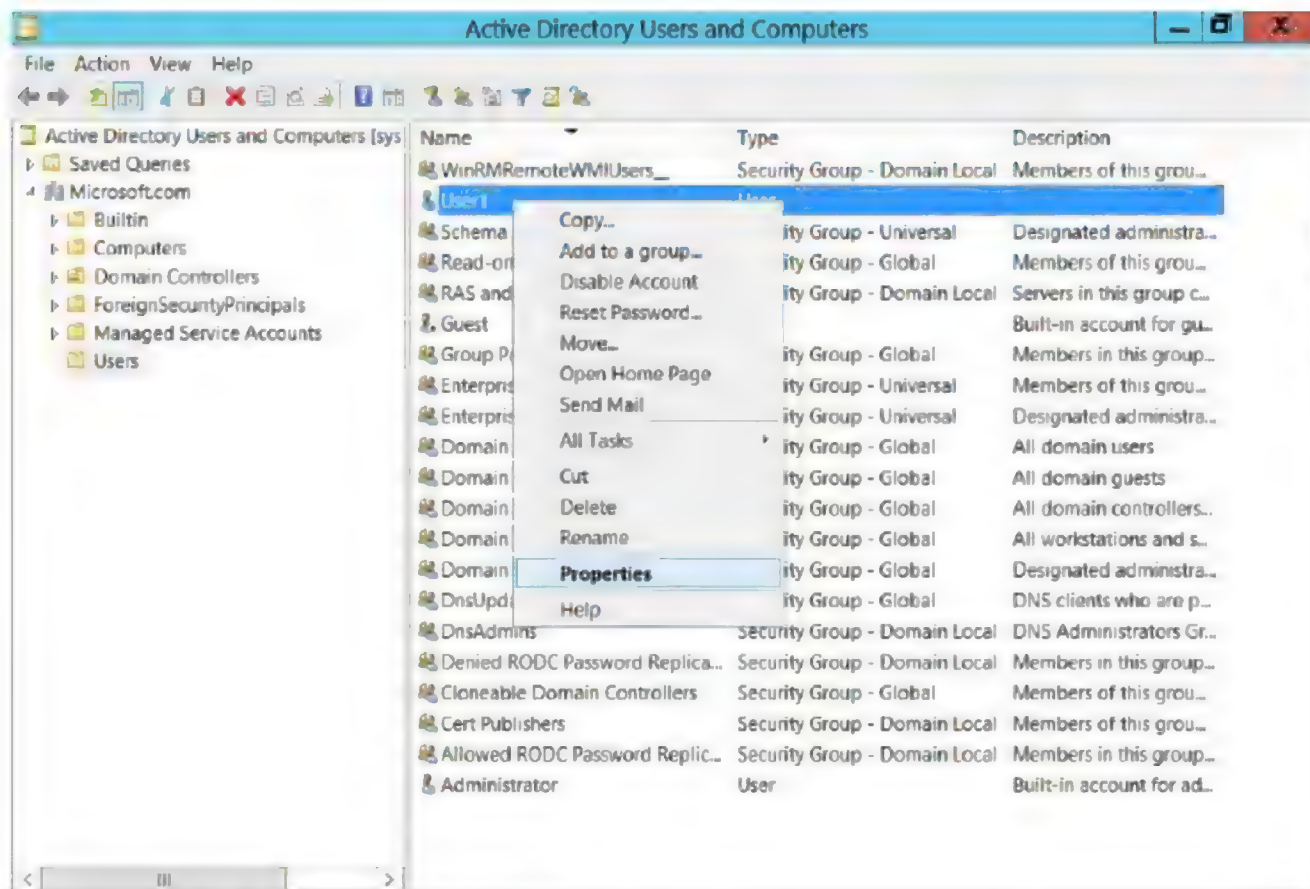
##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1



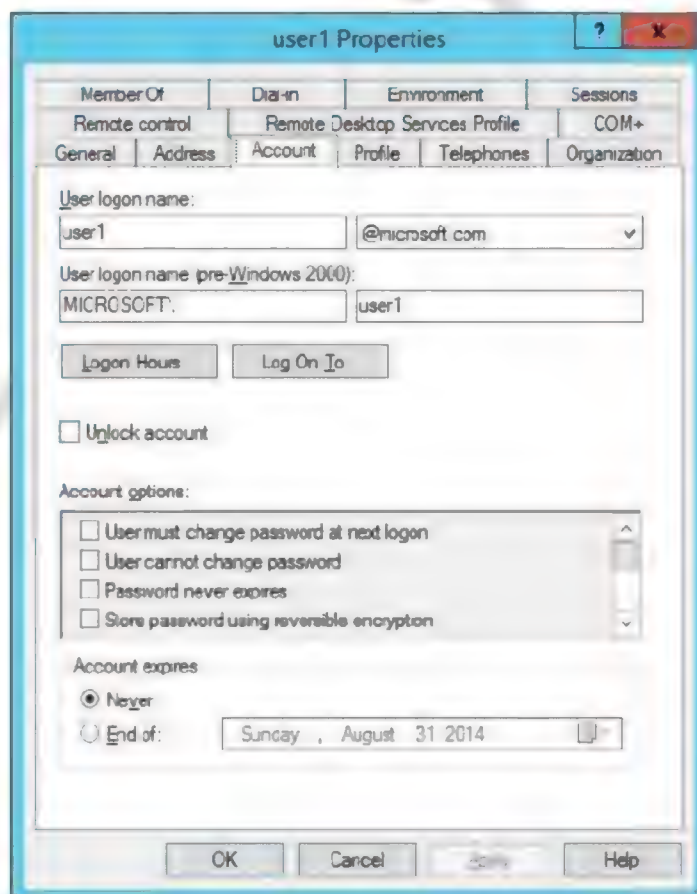
**Steps:**

1. Log on to D.C as Administrator, click Start → Programs → Administrative Tools → **Active Directory Users and Computers**.
2. Right click the User (**User1**) and select **Properties**.



Opens the properties dialog box for the current selection.

3. Select Account, click **Log On To**.

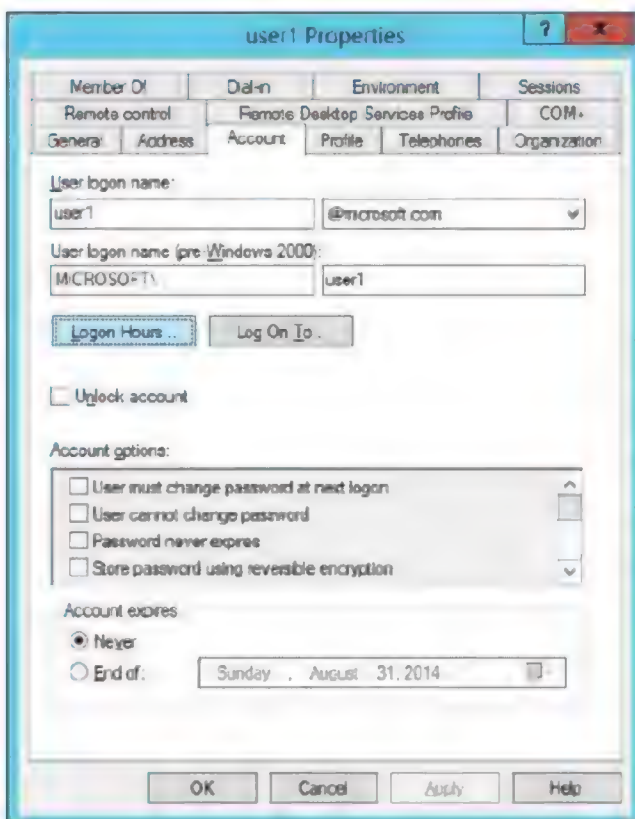




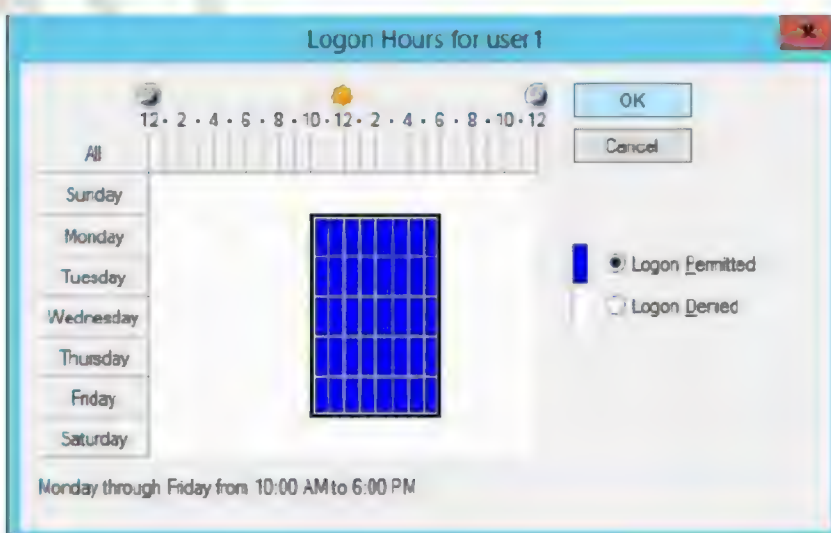
4. Select the following computers, Enter computer name (Ex: sys1), click Add and **OK**.



5. Click **Logon Hours**



6. Select the timing and select **Logon Permitted**.



**Verification:** Try to Log in as User (**User1**) in client or Member server **sys2**

## Lab – 13: Changing Allow Logon Locally Policy

**Objective:**

To allow users logon to domain controller

**Pre-requisites:**

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.

**Topology:**

MICROSOFT.COM

**SYS1****Domain Controller**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

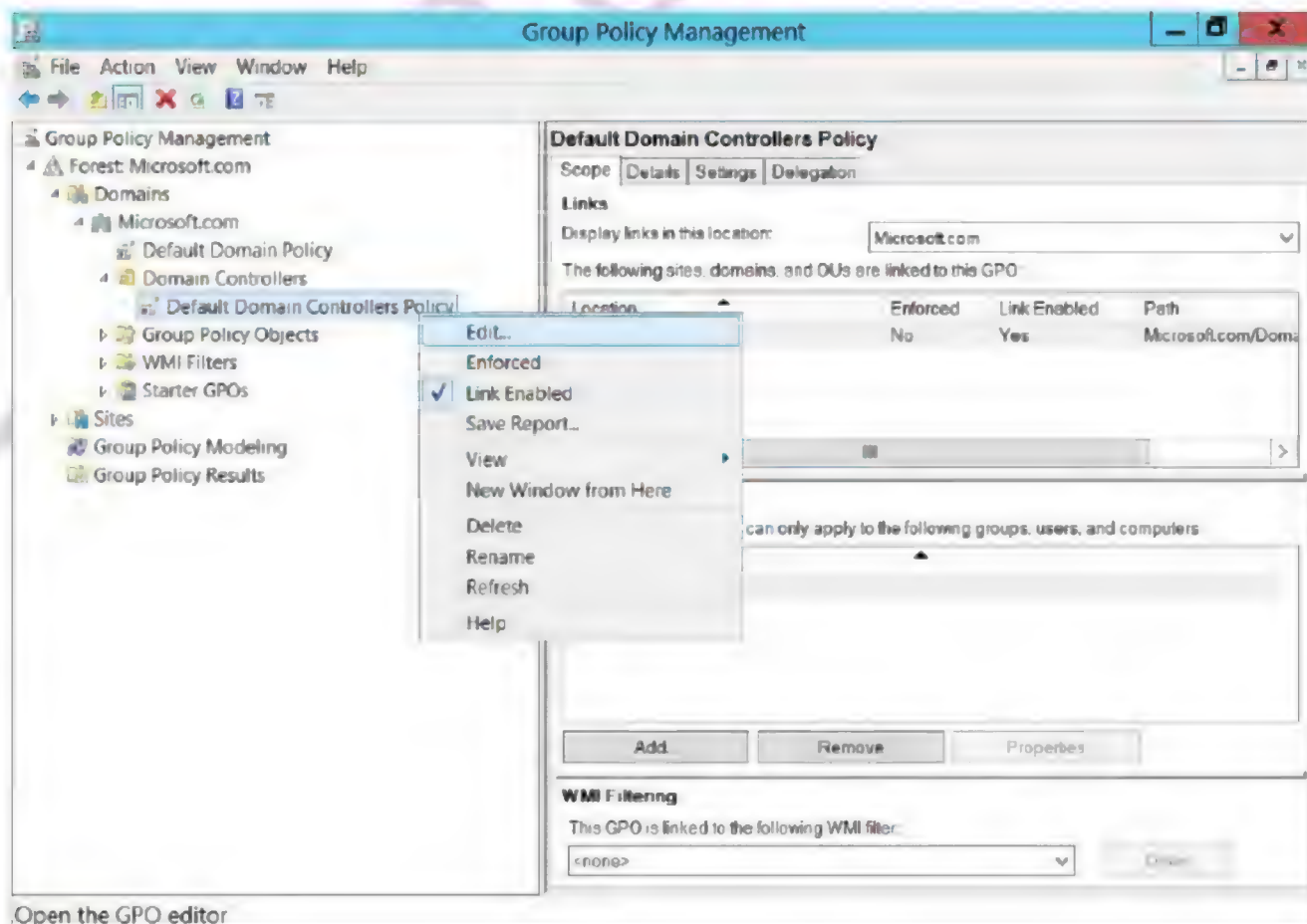


**Steps:**

1. Log in as **Administrator** to the **Domain Controller**, click Press Windows Key to go to Start, select **Group Policy Management**.



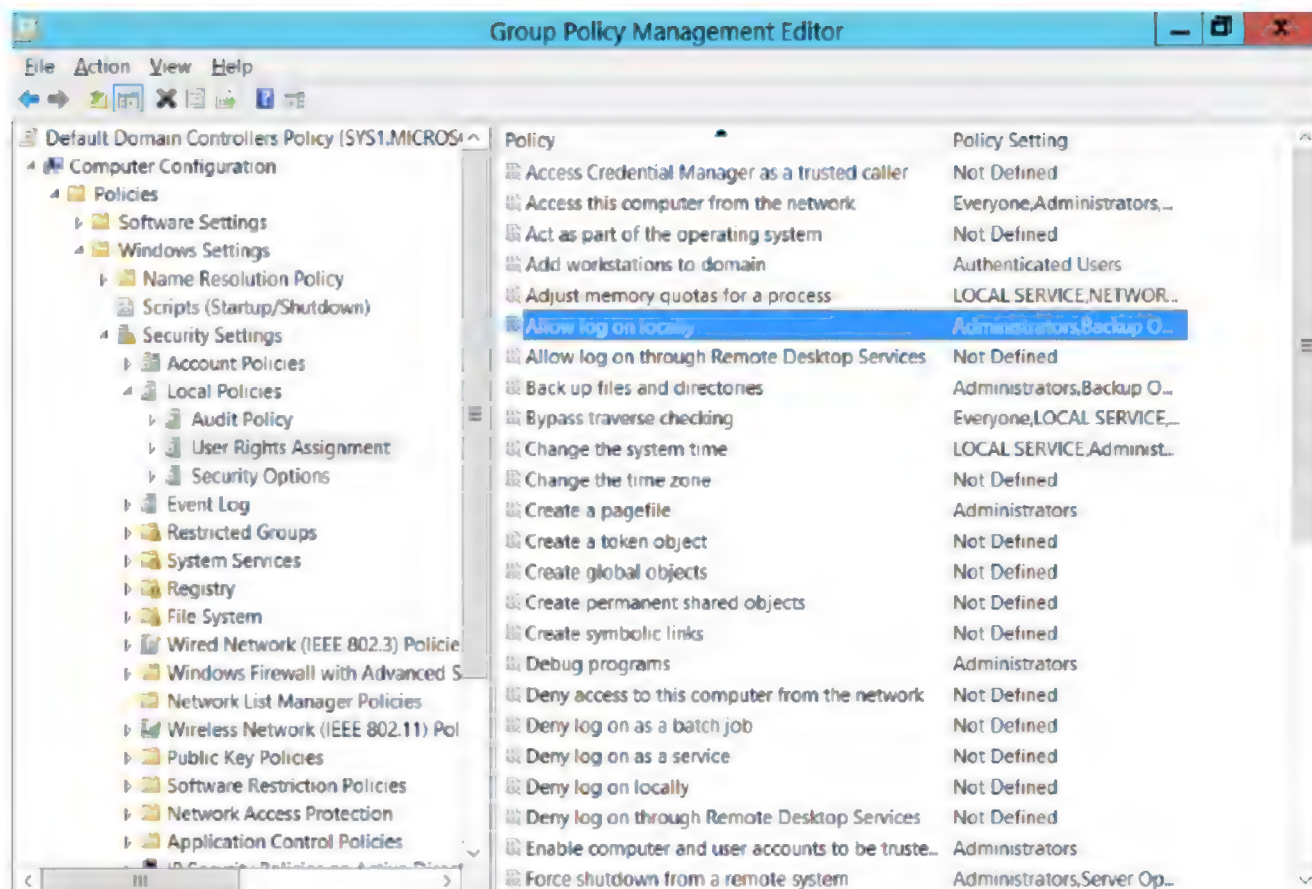
2. Expand **Forest** → Expand **Domains** → Expand **Microsoft.com** → Expand **Domain Controllers** → Right click **Default Domain Controller Policy** and select **Edit**.



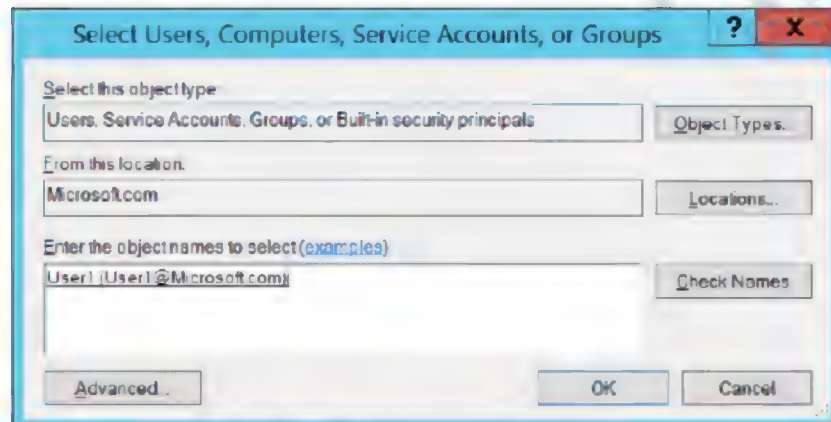
Open the GPO editor



- Expand **Computer Configuration** → Expand **Policies** → Expand **Windows Settings** → Expand **Security Settings** → Expand **Local Policies** → Select **User Rights Assignment** → Double click **Allow logon locally**.



- Click **Add User or Group** → Click **Browse** → Enter the **Username** → Click **OK**.



- Click **OK** → **OK** → **Apply** and **OK**.
- Go to Start, type Run Type Control Panel in Search Apps, and select **Run**, type **GPUPDATE** and it refreshes the policy changes.

### **Verification:**

- Log on to Domain Controller as **Domain User (User1)**.

## Lab – 14: Security Level Permissions

### Objective:

To apply security permissions for securing user data

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

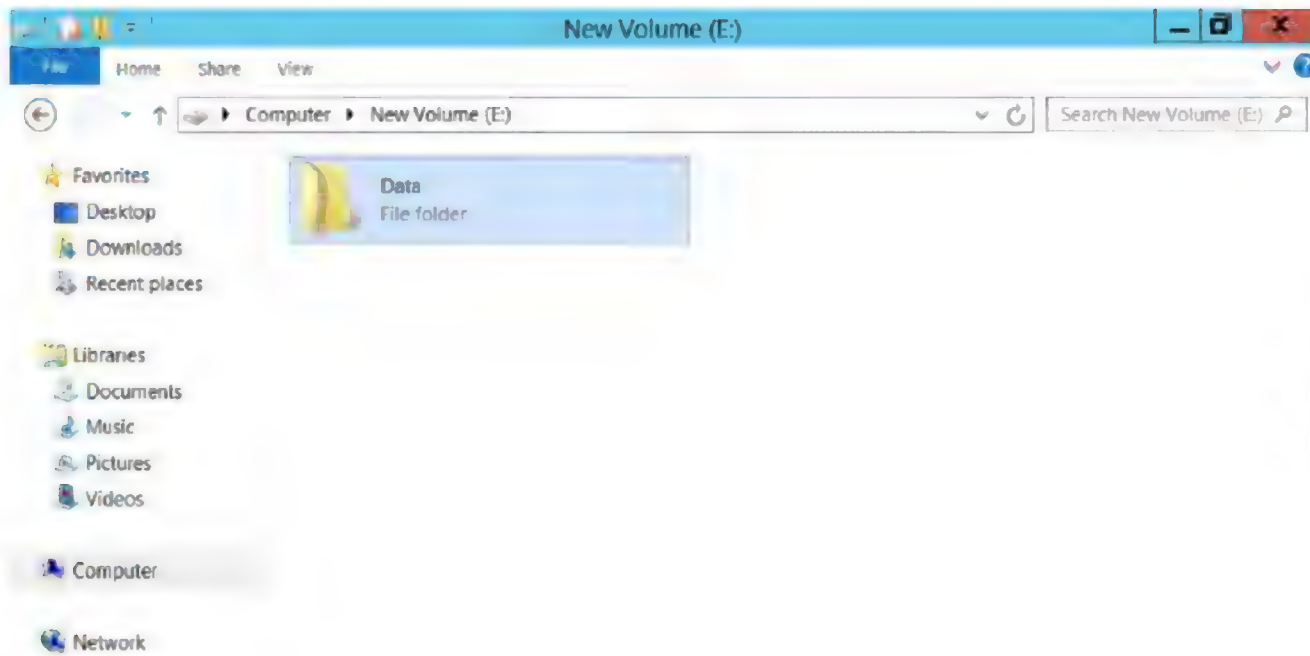
#### SYS2

##### Member Server / Client

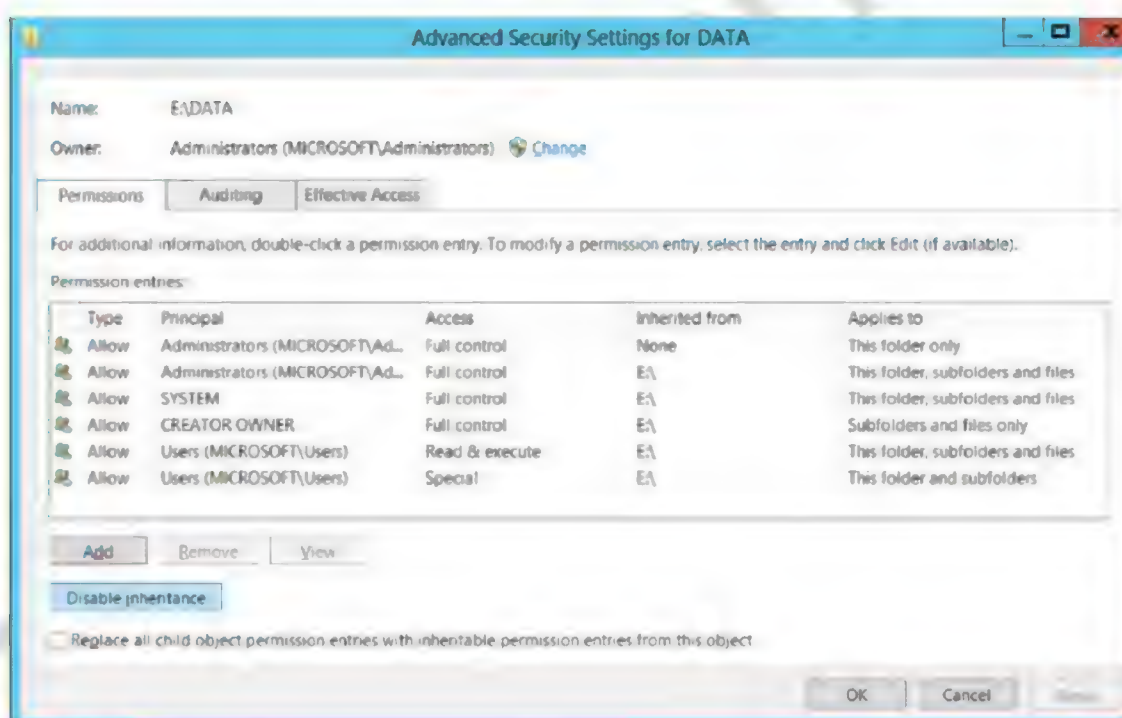
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Open Computer → Go to any NTFS partition and create a folder (**DATA**), along with some files in it.



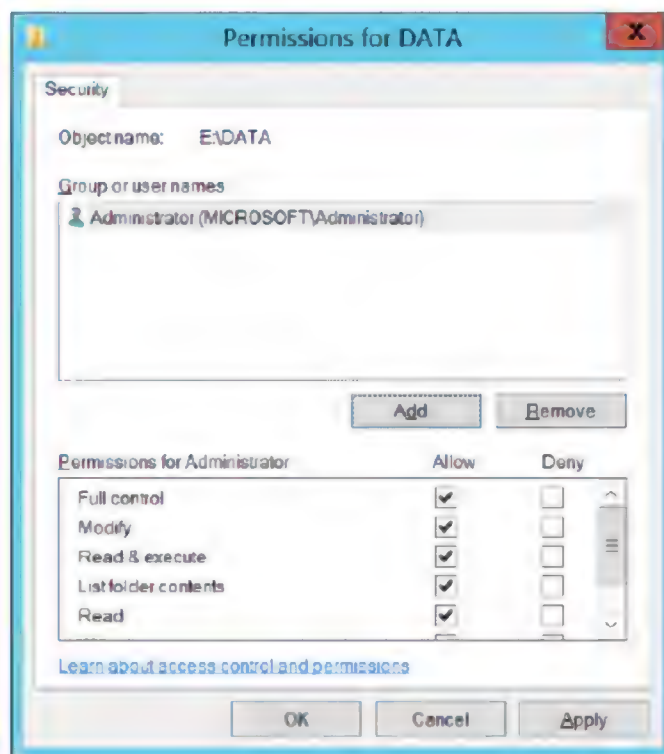
2. Right click the folder (**DATA**) and select properties and click **Security tab** → click **Advanced tab** → click **Edit** → click **Disable inheritance**.



3. Click **Remove** → **Apply** → **OK** → **OK**
4. Click **Edit**



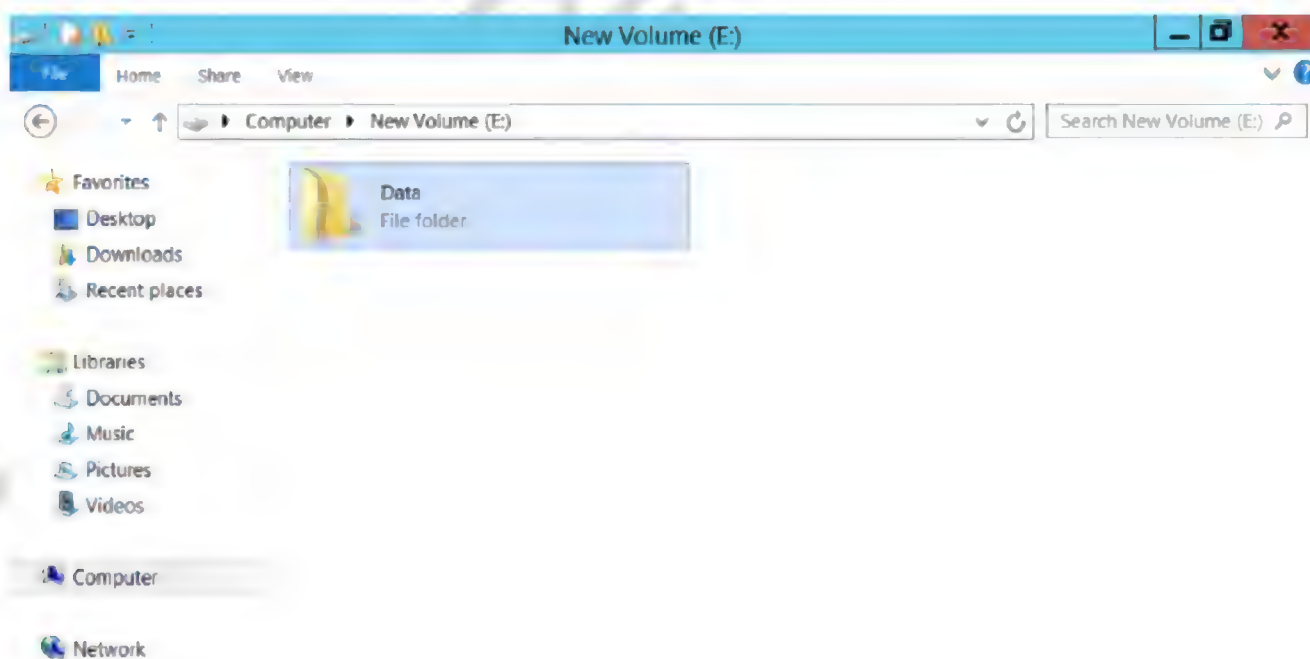
5. Add **Administrator Administrators** and allow **Full control** permission.



6. Then Add the **Users (User1)** and Allow **Read** permission.
7. Click **Apply** → **OK** → **OK**

**Verification:**

1. Login as User (**User1**) on the same computer, and Open Computer icon, and verify the respective permissions by accessing the folder.



2. The User can just read the Files and Folders.

## Lab – 15: Share Level Permissions

### Objective:

To apply permissions on shared folders that protects files accessed across network

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

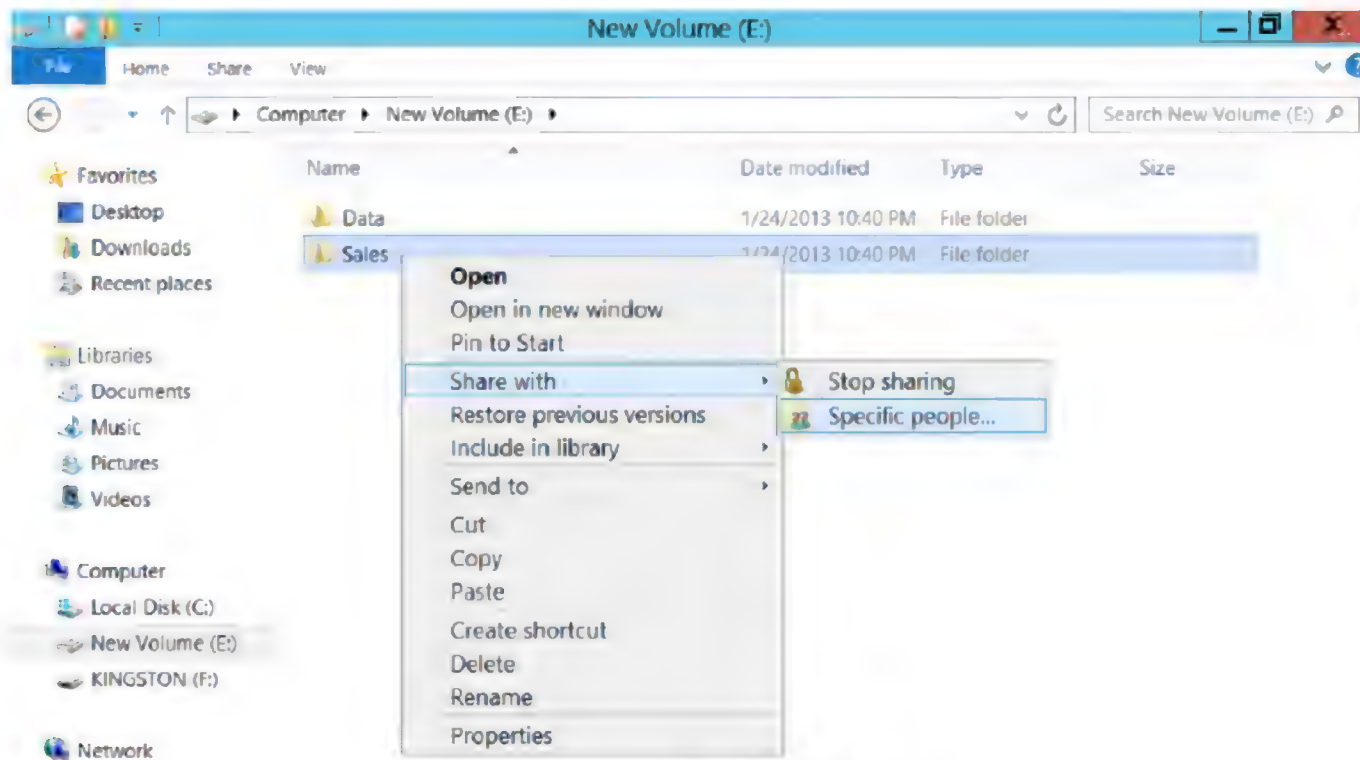
#### SYS2

##### Member Server / Client

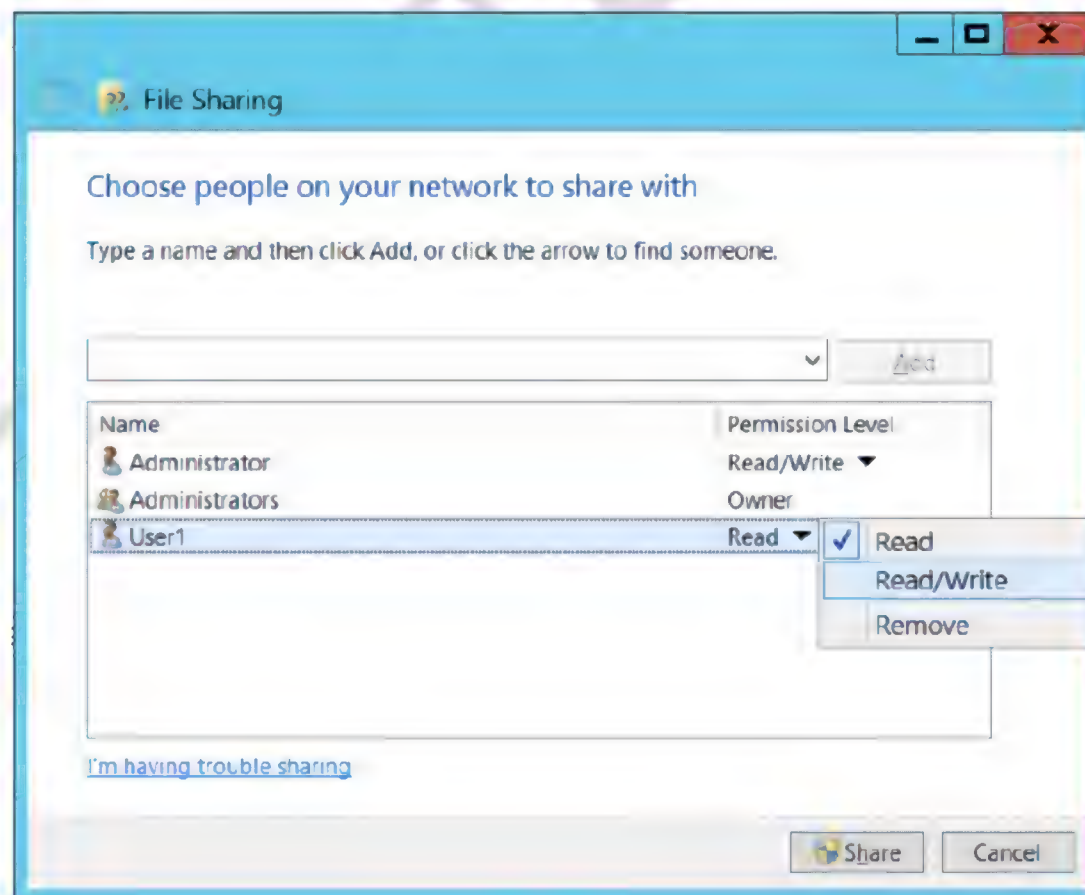
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Logon to a Computer as **Administrator**, Open **Computer** → Open any drive and create a folder (**SALES**) along with some files in it.
2. Right click the folder (**SALES**) and Select **Share**



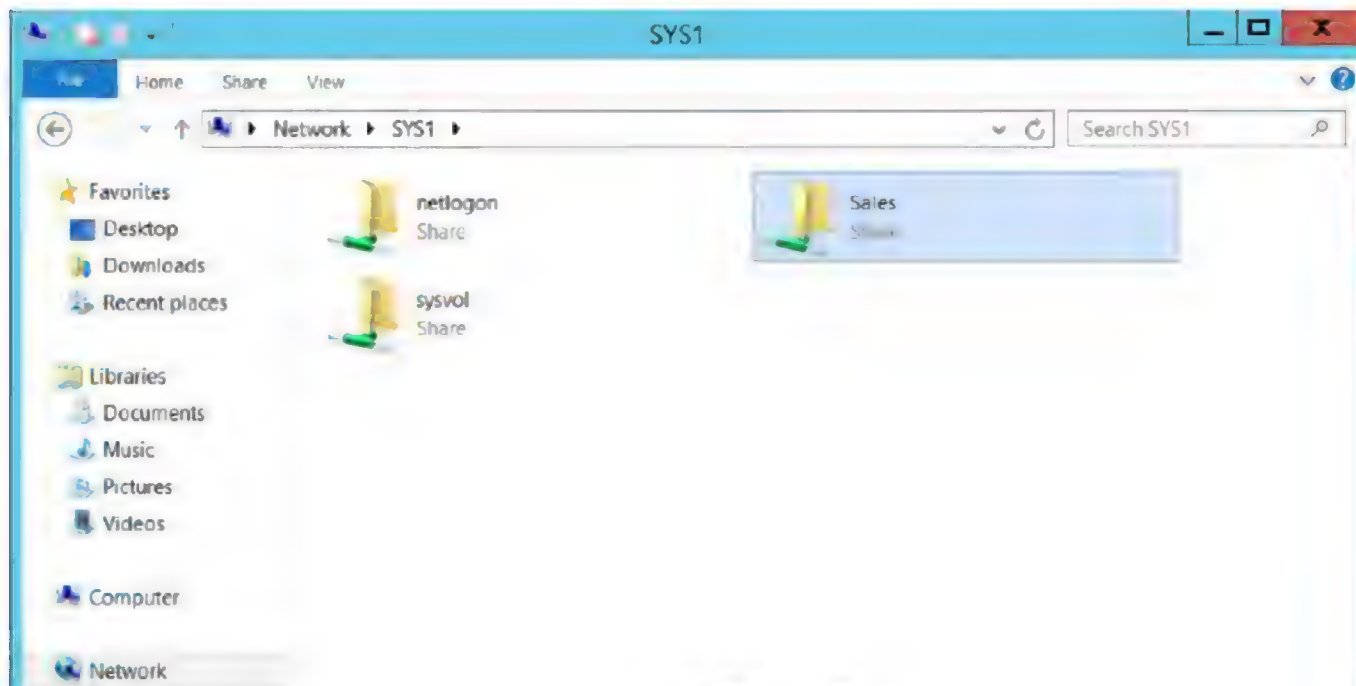
3. Select the drop down arrow mark and select **Find** → enter the User name (**User1**) → click **OK** → select the User(**User1**) and assign Permissions (Ex: **Read/Write**) → click **Share** → click **Done**.



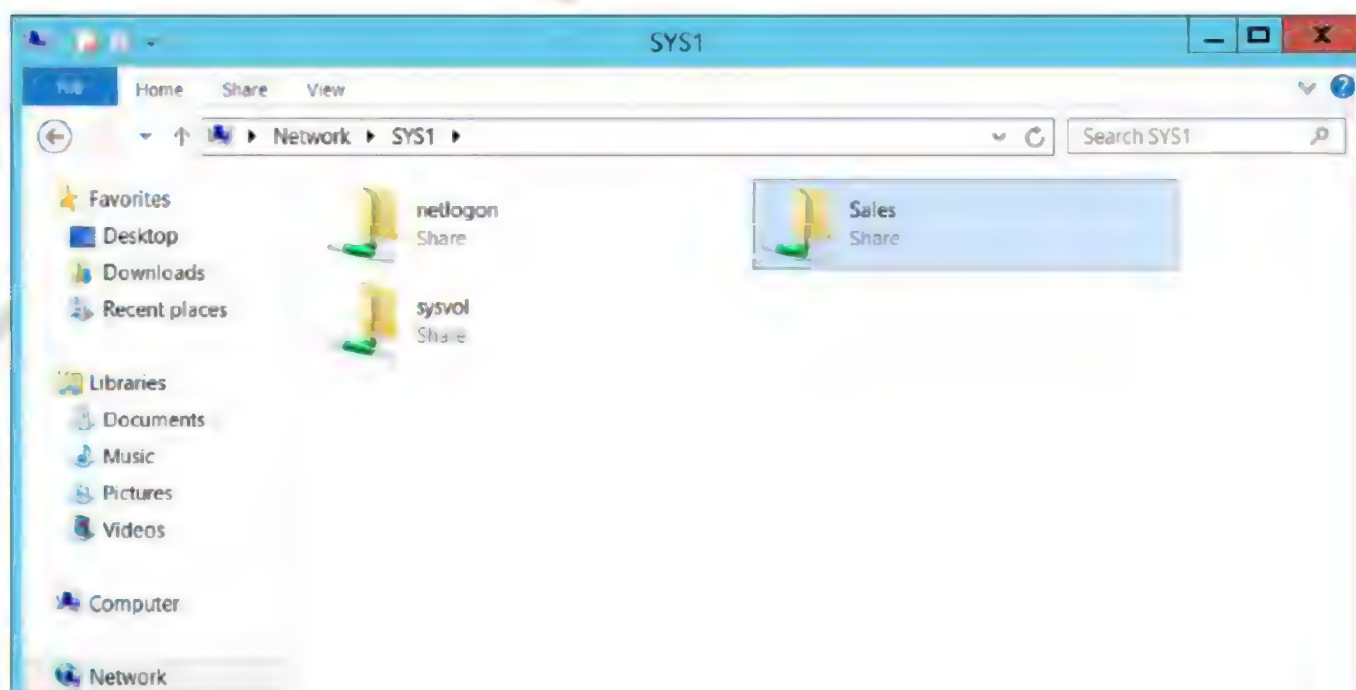


**Verification:****Access the Shared folder**

1. Logon to Member Server or Client as User (**User1**) → Open **Network**.
2. Open **System Name** in which the shared folder is present.
3. Access the shared folder (**SALES**) & verify the permissions by creating some files.

**Accessing Shared folders using UNC Path:**

1. Logon to Member server or Client as a User.
2. Click Start → click Run and type the Syntax **\\Servername\Sharename**. Example: **\\SYS1\SALES**



## Lab – 16: Adding Mapped Drives

### Objective:

To map share folders as drives

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

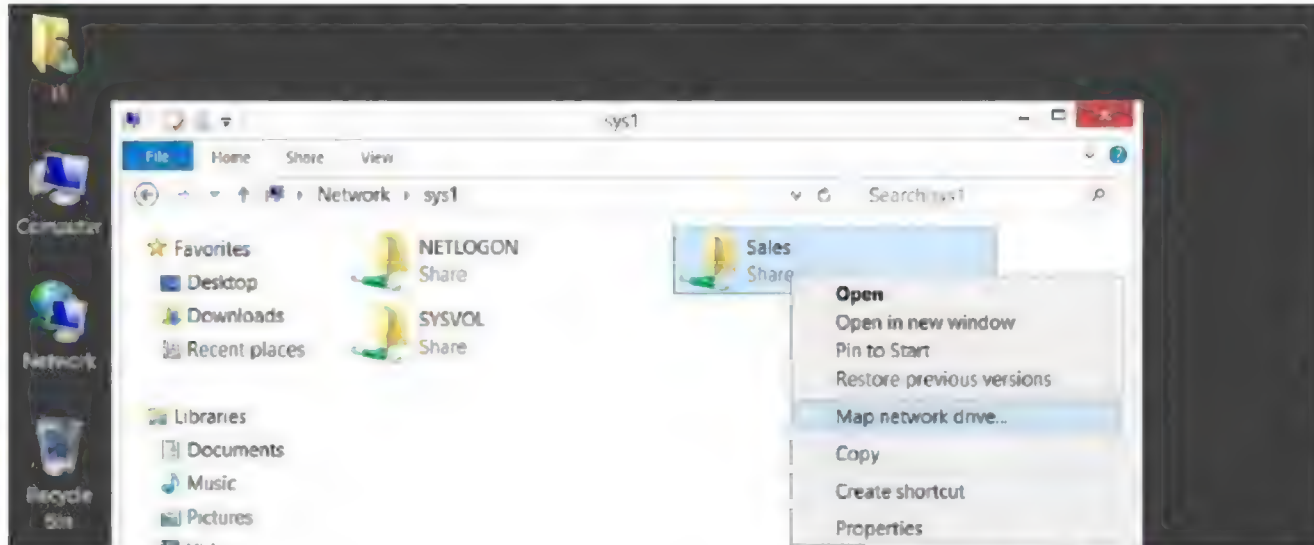
#### SYS2

##### Member Server / Client

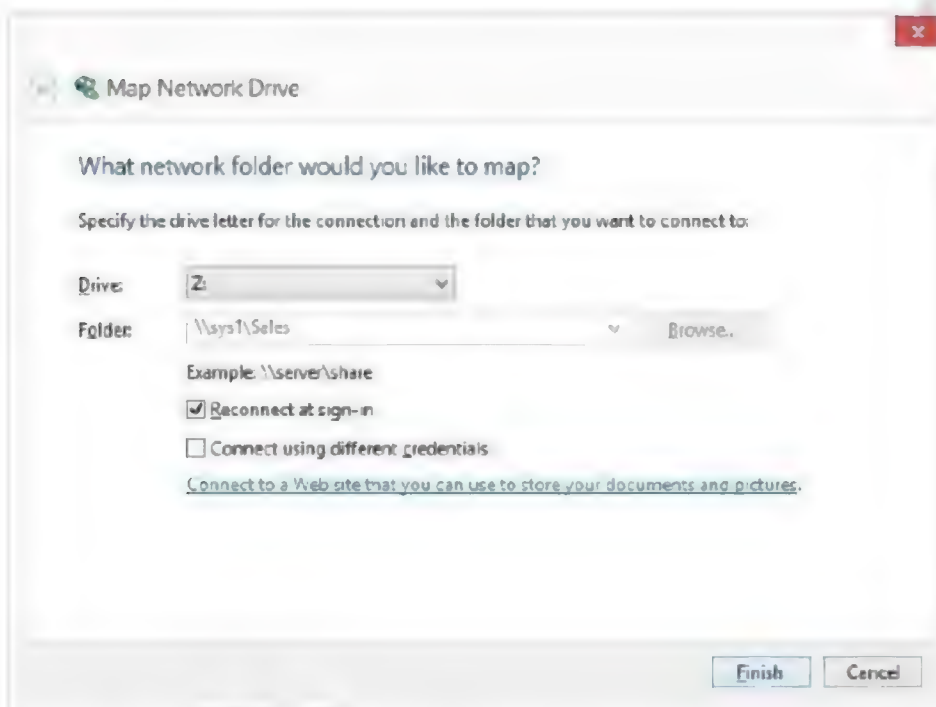
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

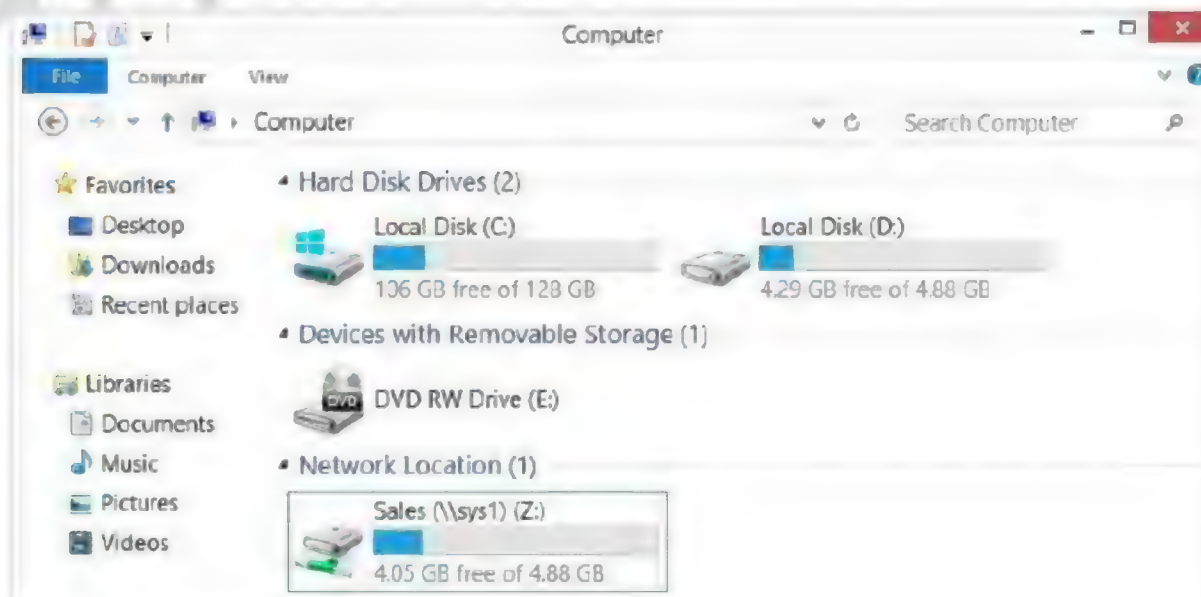
1. Logon to Member server or Client as a User.
2. Access the shared folder Sales, Right click on sales folder, select **Map network drive**.



3. Select the Drive letter (Ex: Z:) and click **Finish**.



**Verification:** Open Computer Icon and verify for Mapped network Drive





## Lab – 17: Verifying Access Based Enumeration

### Objective:

To show only files and folders to which a user has at least read permissions

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7 .

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

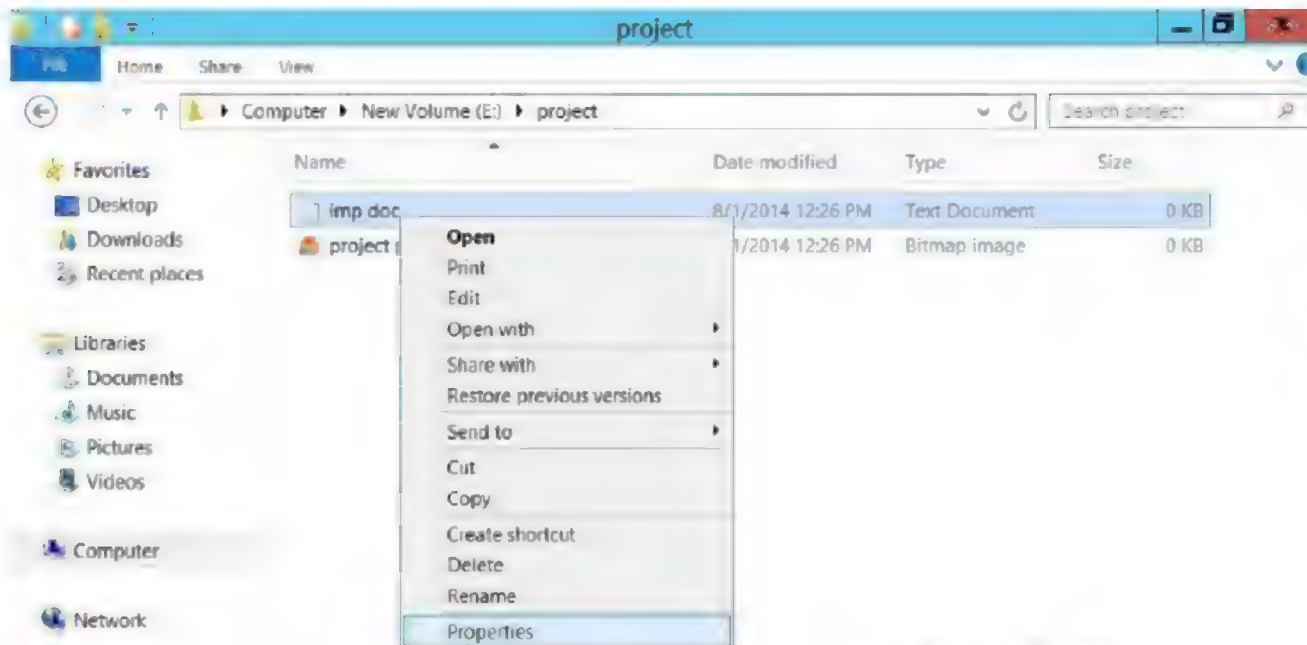
#### SYS2

##### Member Server / Client

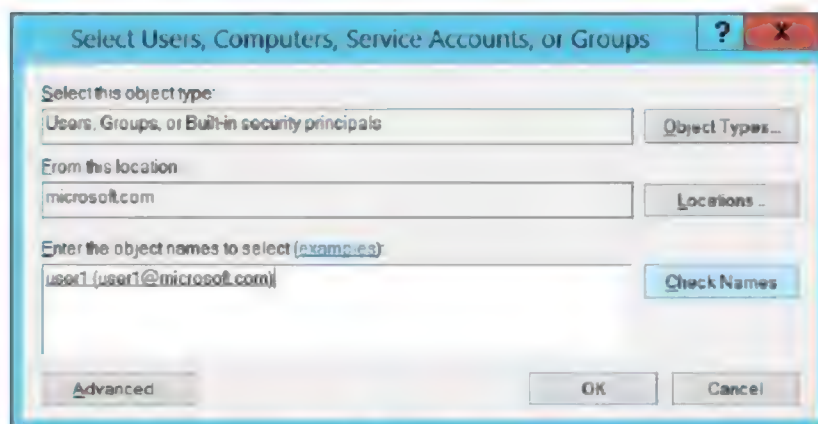
IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

**Steps:**

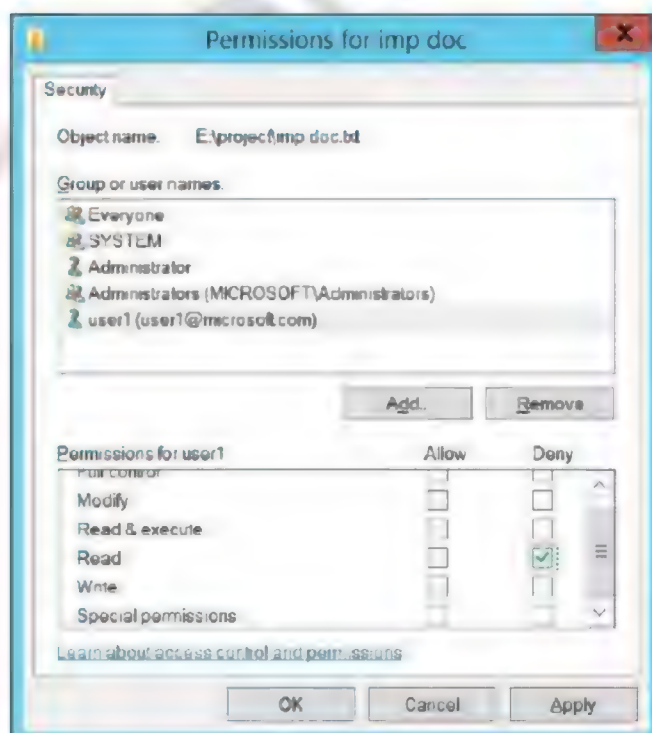
1. Logon to a Sys1 as **Administrator**, Open **Computer**→ Open any drive and create a shared folder (**Ex: Project**) with everyone Read/ Write permissions along with some files in it. 2. Right click on one of the file and select **Properties**



2. Select **Security**, click **Edit** and **Add**, Enter **user1**, click **OK**

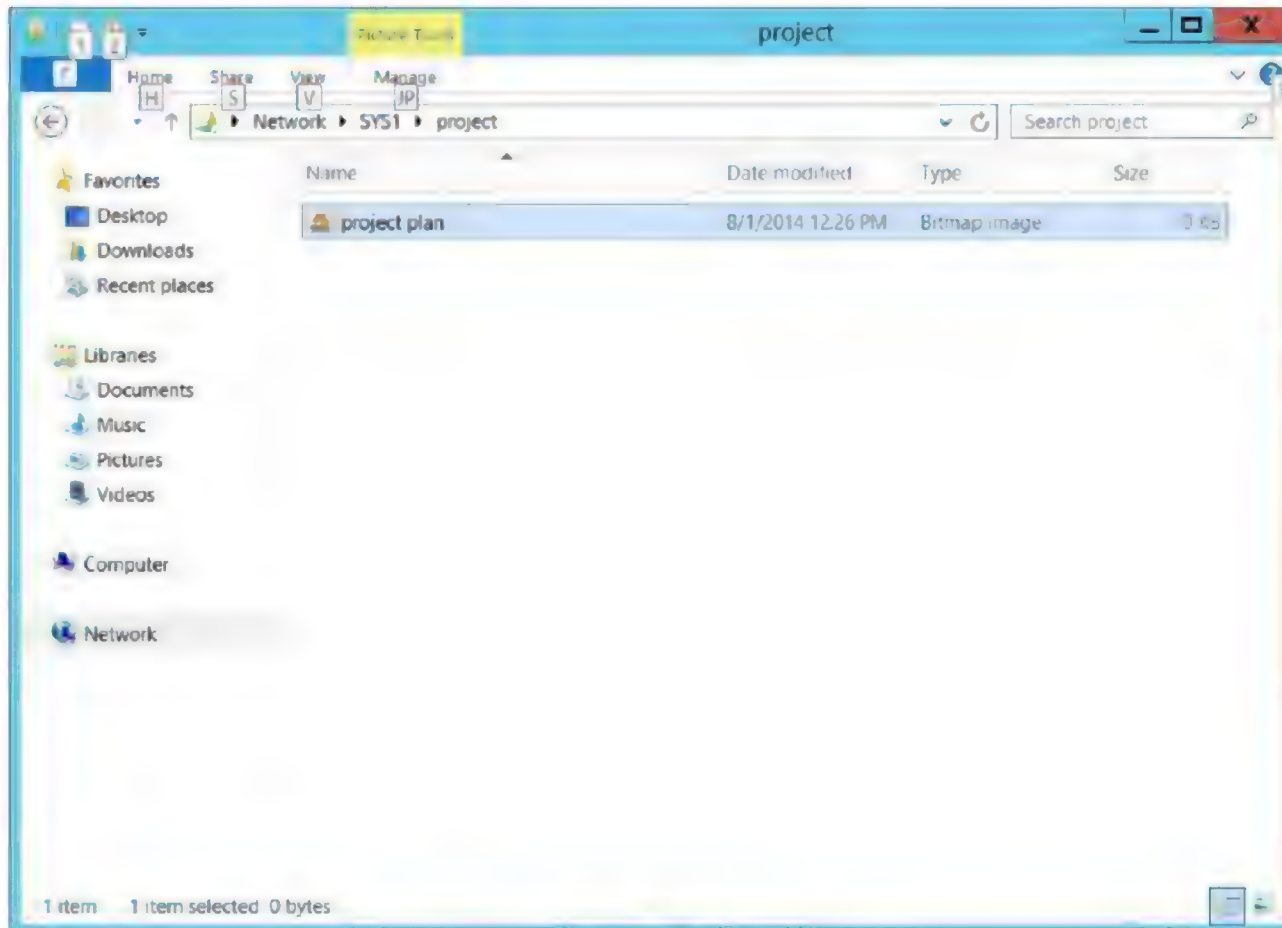


3. Select **user1** and set the permission **Deny Read**, click **OK**.



**Verification:**

1. Logon to Member Server or Client as User (**User1**).
2. Open **Network Icon**, Select SYS1, access the shared folder Project and verify for the files present.





## Lab – 18: Configuring Local Profiles

### Objective:

To Configure Local Profiles For Domain Users

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

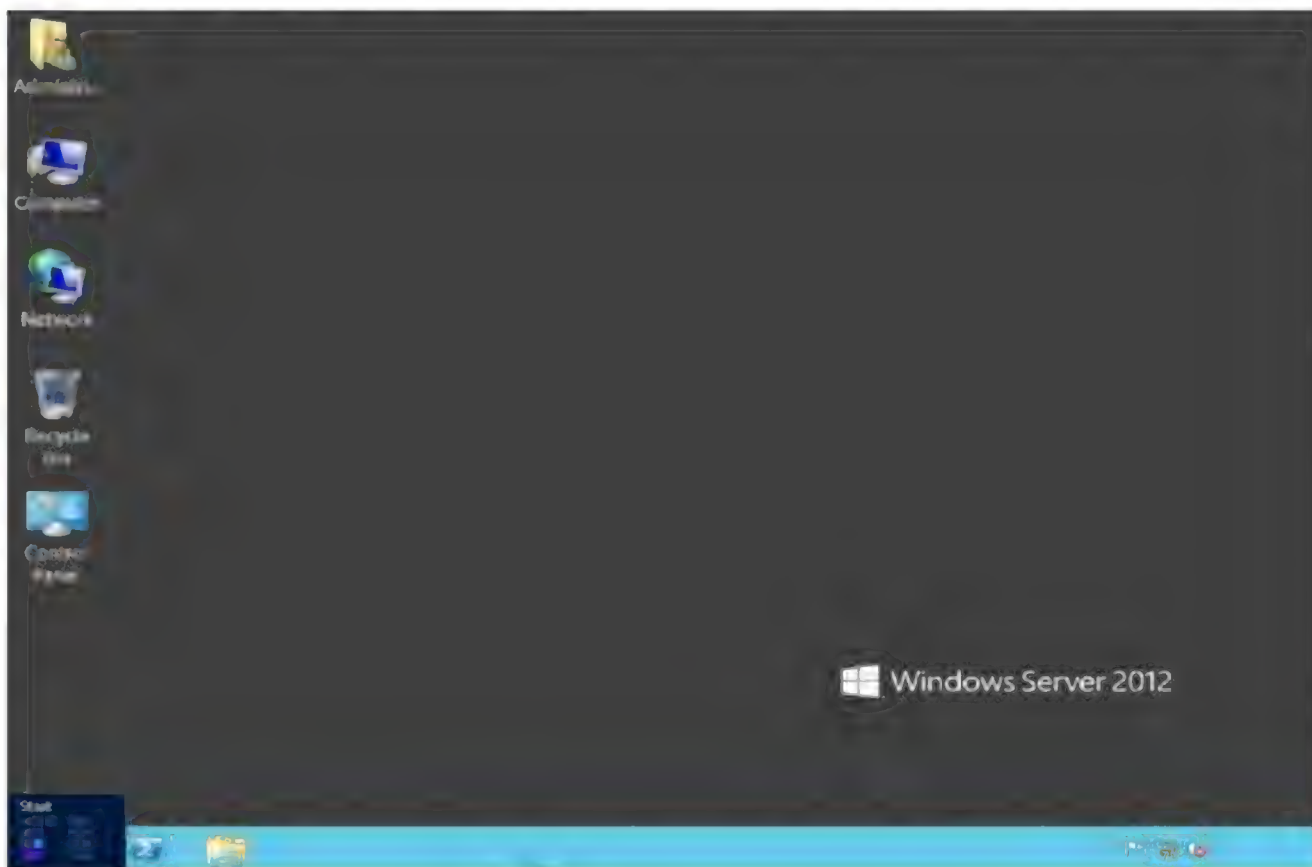
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

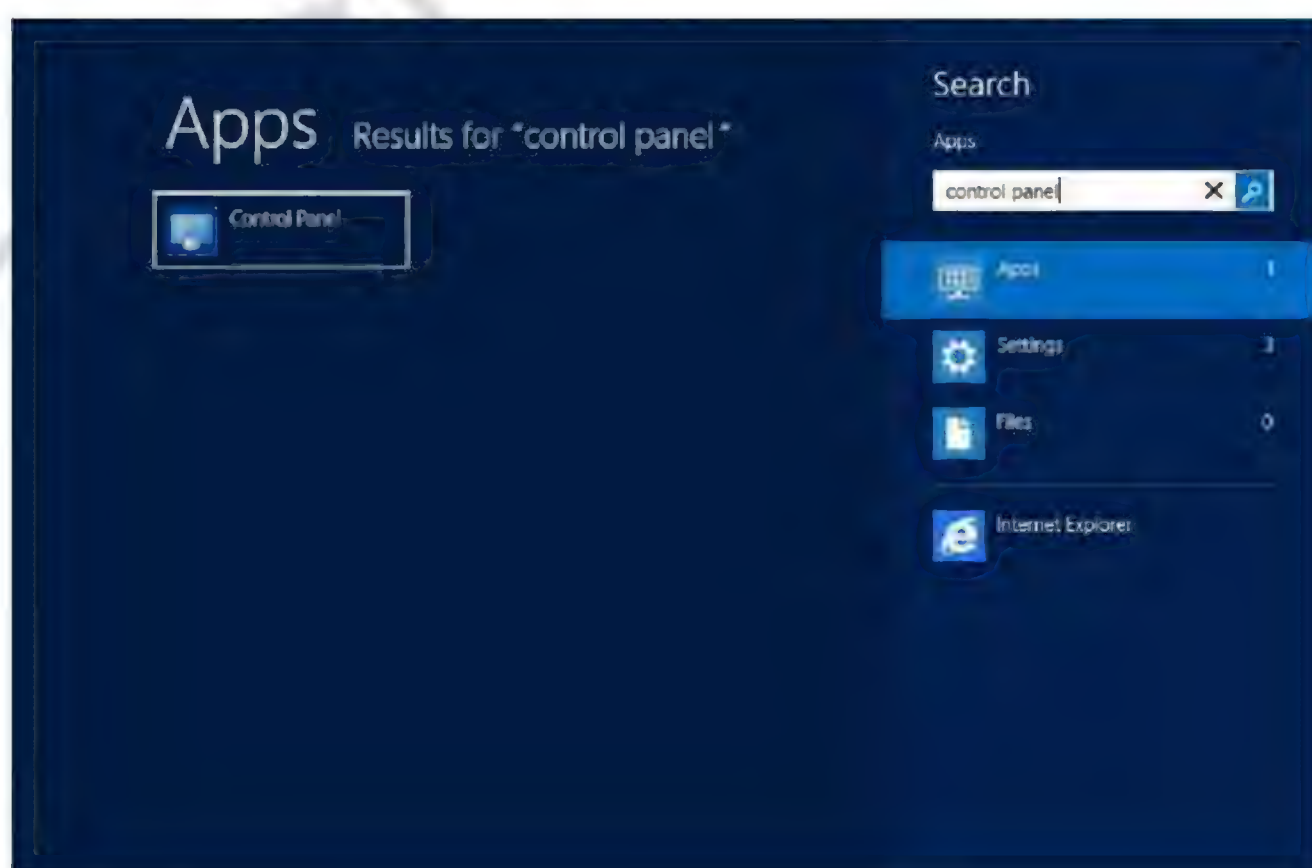
1. Log on to **Domain Controller** as **Administrator**.
2. Go to **Active Directory Users and Computers** and create **Users** (Ex: user1, user2).

**Verification:**

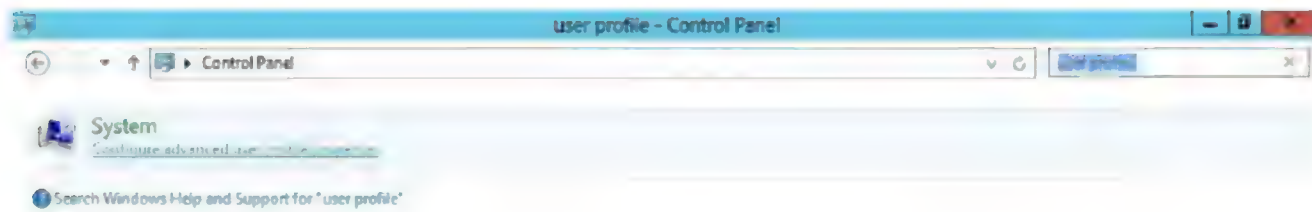
1. Login as **User (user1)** on **Client** or **Member Server**.
2. Press Windows key to go Start,



3. Type Control Panel in Search Apps, and select **Control Panel**.



4. In Control Panel search bar, type **user profile**, select **Configure advanced user profile properties**.



5. Verify for User **Profile Type** and **Status** to be **Local**.



6. Create some files on desktop and go to C: drive → Open Users → Open the user profile (user1) folder → open desktop folder → verify for the files created on Desktop.



## Lab – 19: Configuring Roaming Profiles

### Objective:

To Configure Roaming Profiles so that user profile will be carried over the network

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

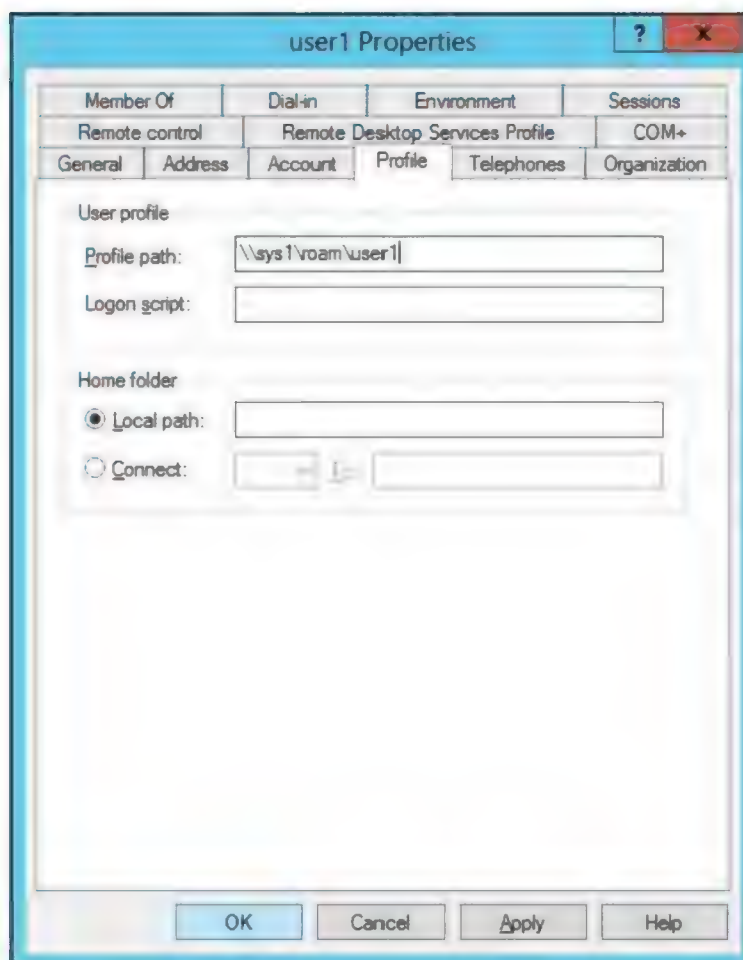
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Log on to D.C as Administrator, Open **Computer** → Go to a drive and create a shared folder **roam** with **Everyone Read/Write** permission.
2. Go to **Active Directory Users and Computers** → Expand the Domain Name (**MICROSOFT.COM**) → click **Users** → Right click the User(**user1**) and select **Properties** and select the **Profile** tab.
3. Under User profile → enter profile path as

Syntax: **\\Servername\Shared Folder Name\User Name**

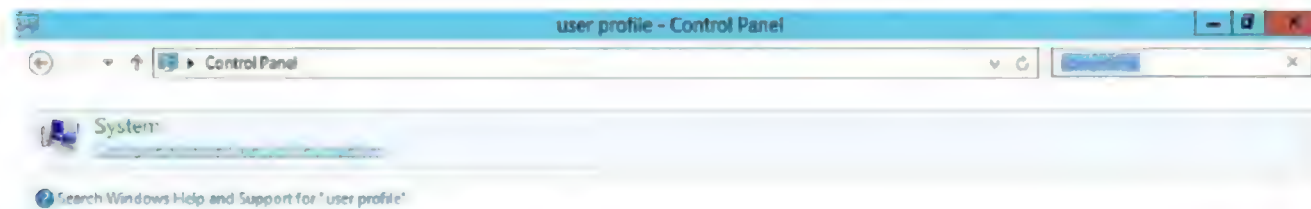
Example: **\\SYS1\roam\user1.**



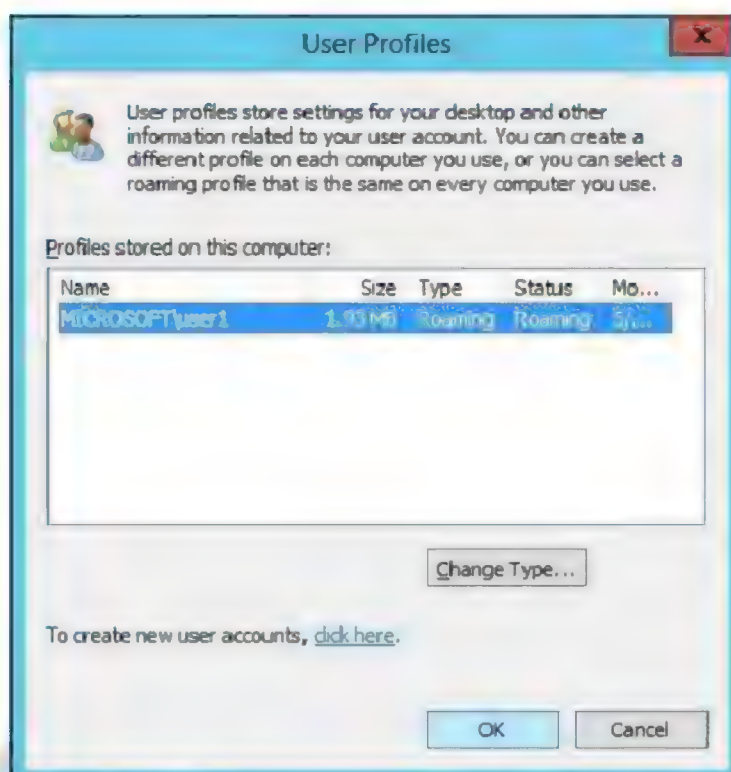
4. Click **Apply** and **OK**.

**Verification:**

1. Login as user **user1** on Client or Member Server and create some files on the Desktop.
2. In Control Panel search bar, type **user profile**, select **Configure advanced user profile properties**.



3. Verify for User **Profile Type** and **Status** to be **Roaming**.



4. Logoff this user (**user1**) and login on another computer with the same user (**user1**), we can see the files which we have created on first computer.



## Lab – 20: Configuring Home Folder

### Objective:

To configure network drives for Domain users

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

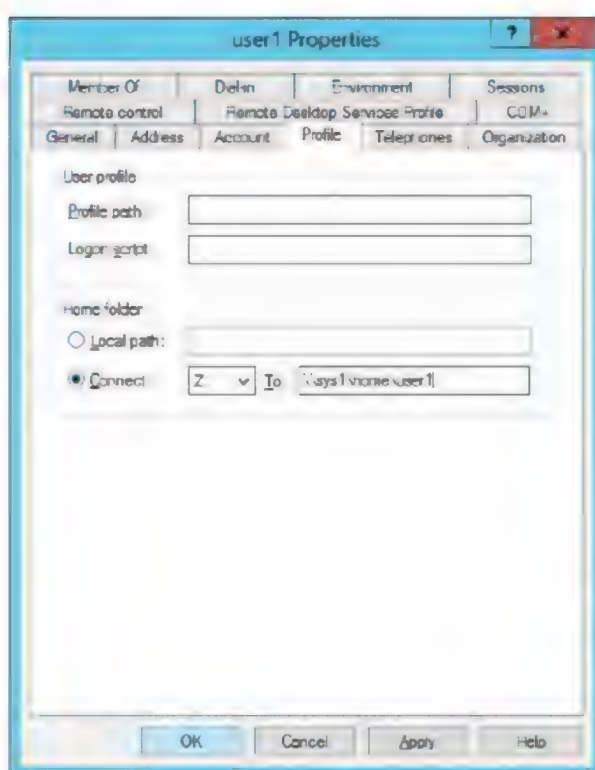
##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Log on to D.C as Administrator, Open **Computer** → Go to a drive and create a shared folder **home** with **Everyone Read/Write** permission.
2. Go to **Active Directory Users and Computers** → select **Users** and right click **User user1** and click **Properties**.
3. Select the **Profile tab** Under the **Home folder**, select **Connect** and Select a drive letter **Z:** and in **To:** enter **\\Server Name\Share Name\User Name**.

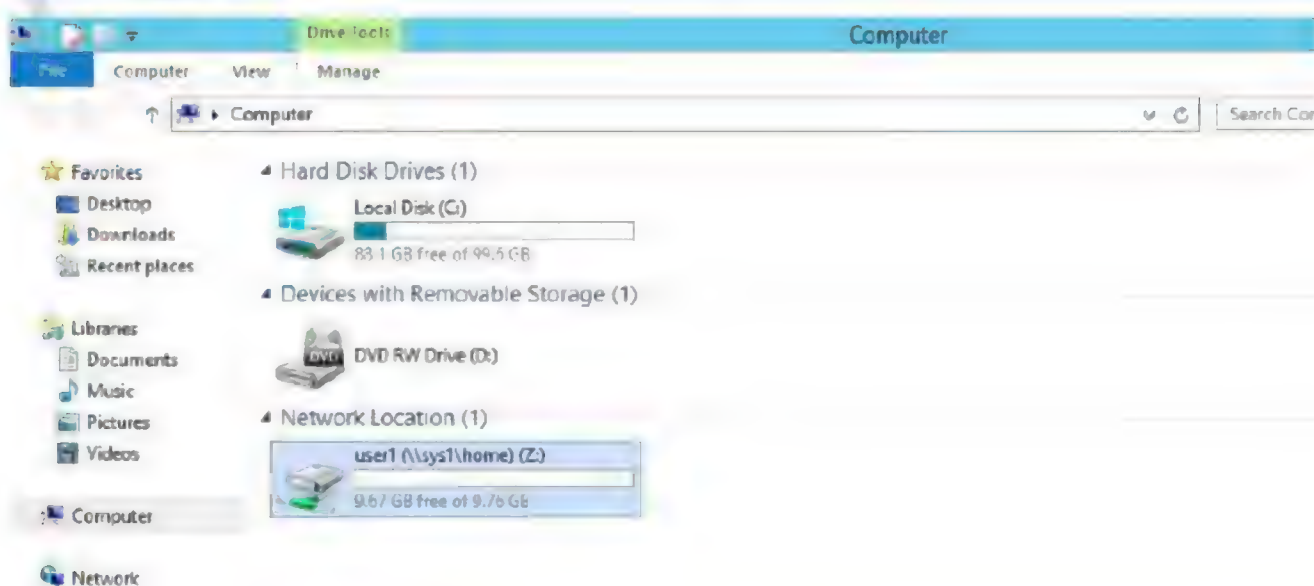
Example: **\\SYS1\home\user1**.



4. Click **Apply** and **OK**.

**Verification:**

1. Login as user (**user1**) on **Client** or **Member Server**.
2. Open **Computer**, Locate Home folder under network drives.



## Lab – 21: Installing and Configuring File server resource manager

### Objective:

To manage and monitor files created by users Using file server resource manager

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

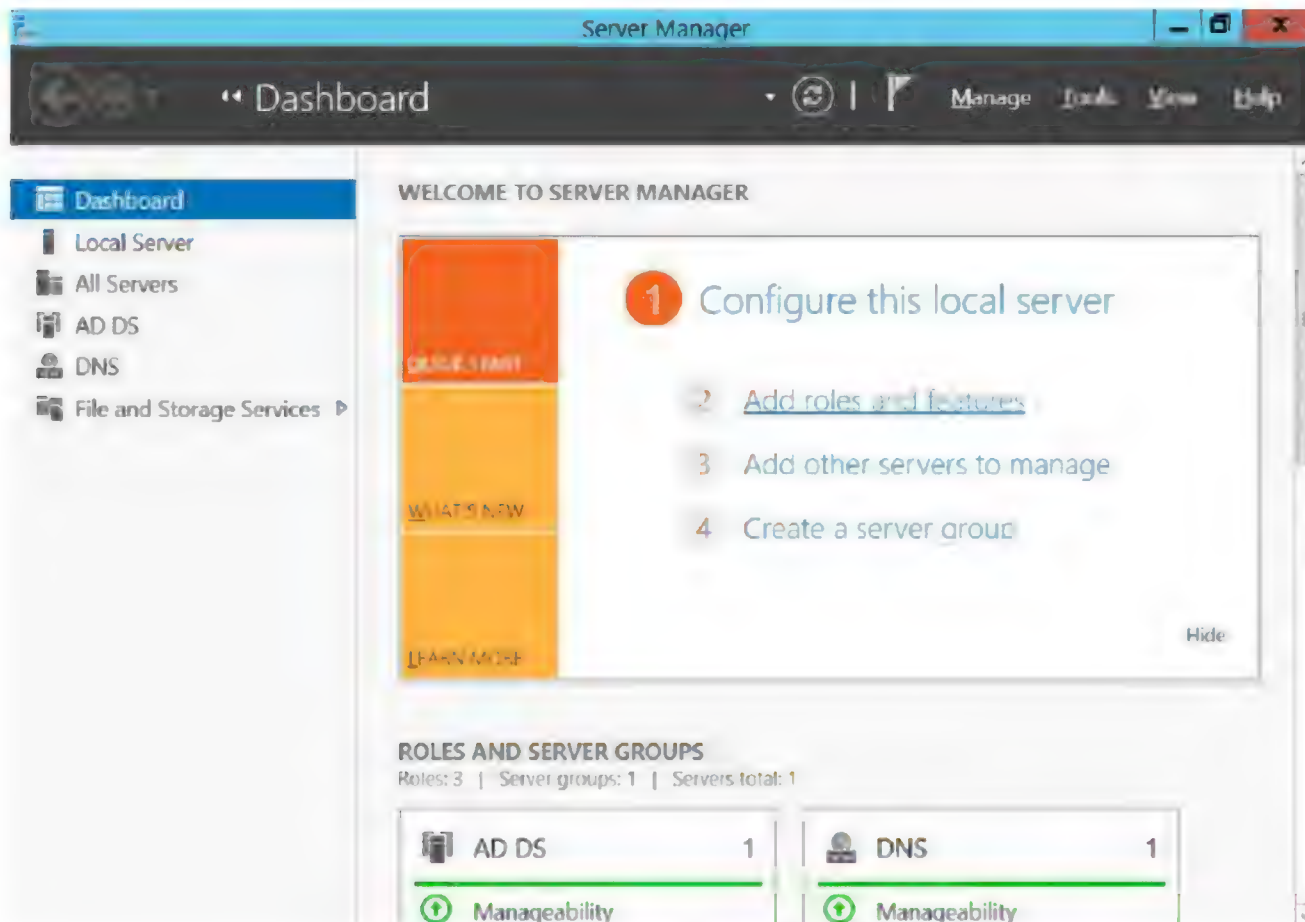
##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

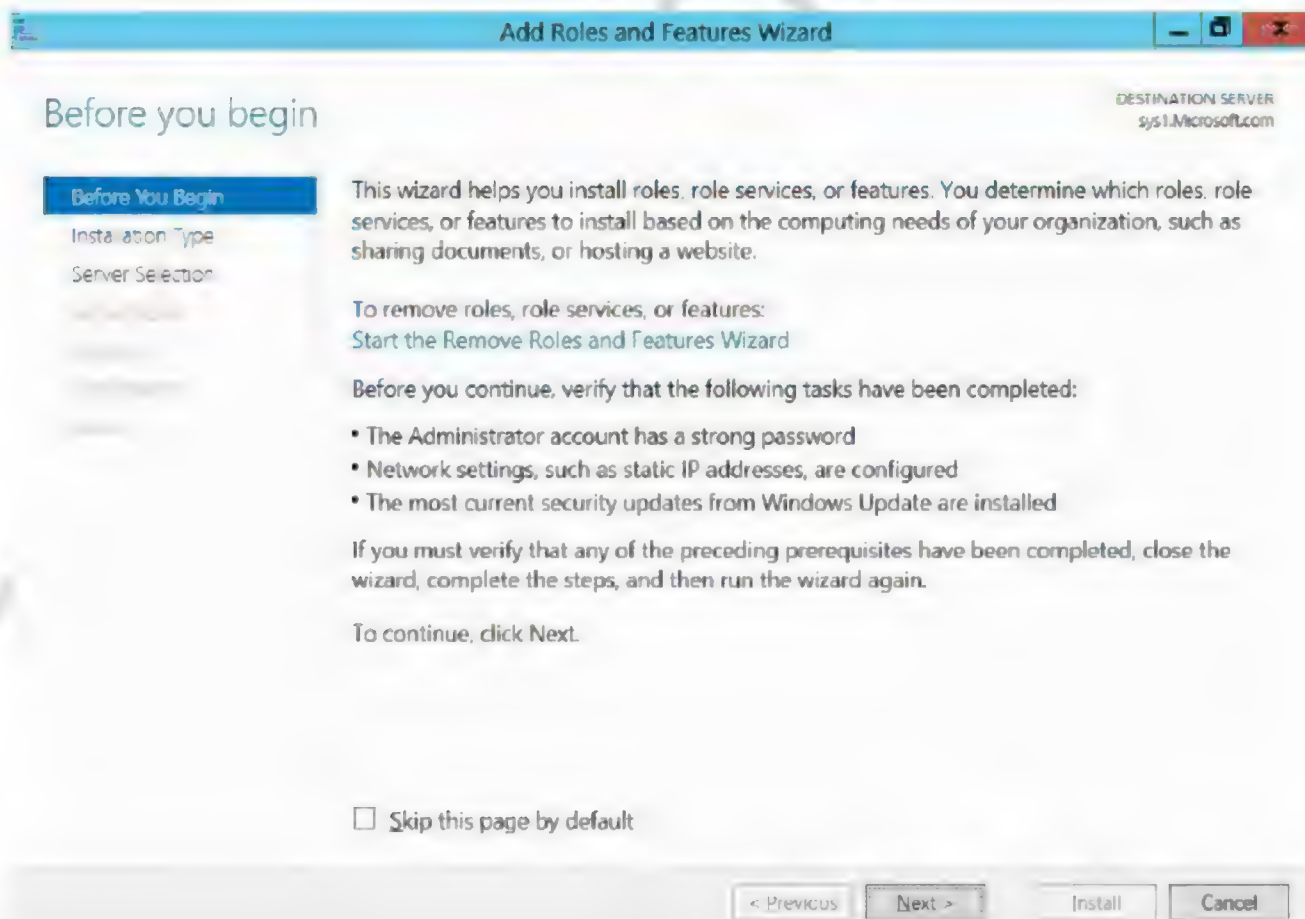


## Installing FSRM

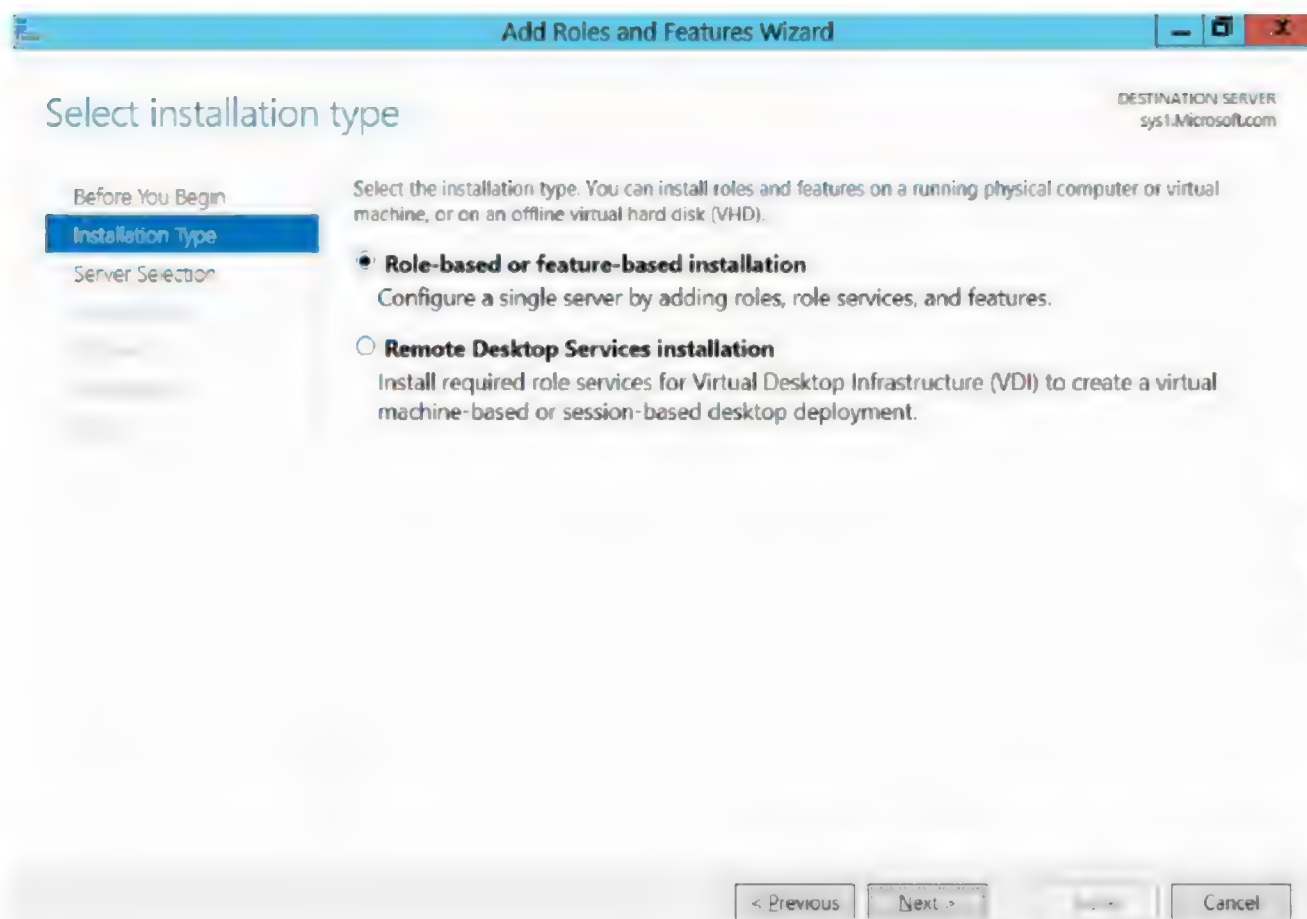
1. In Server Manager Dashboard, click **Add roles and features**.



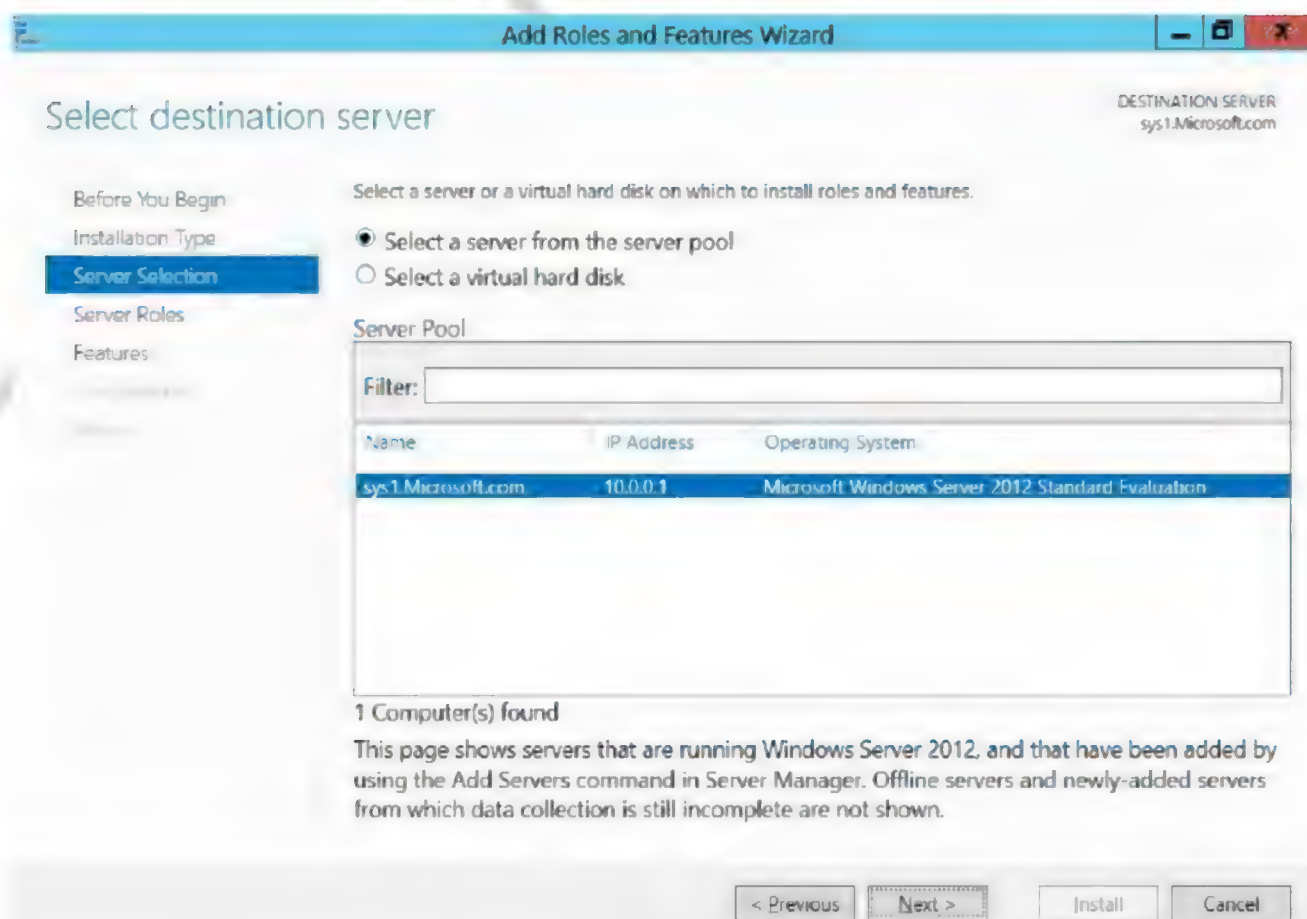
2. In Before you begin page, click **Next**.



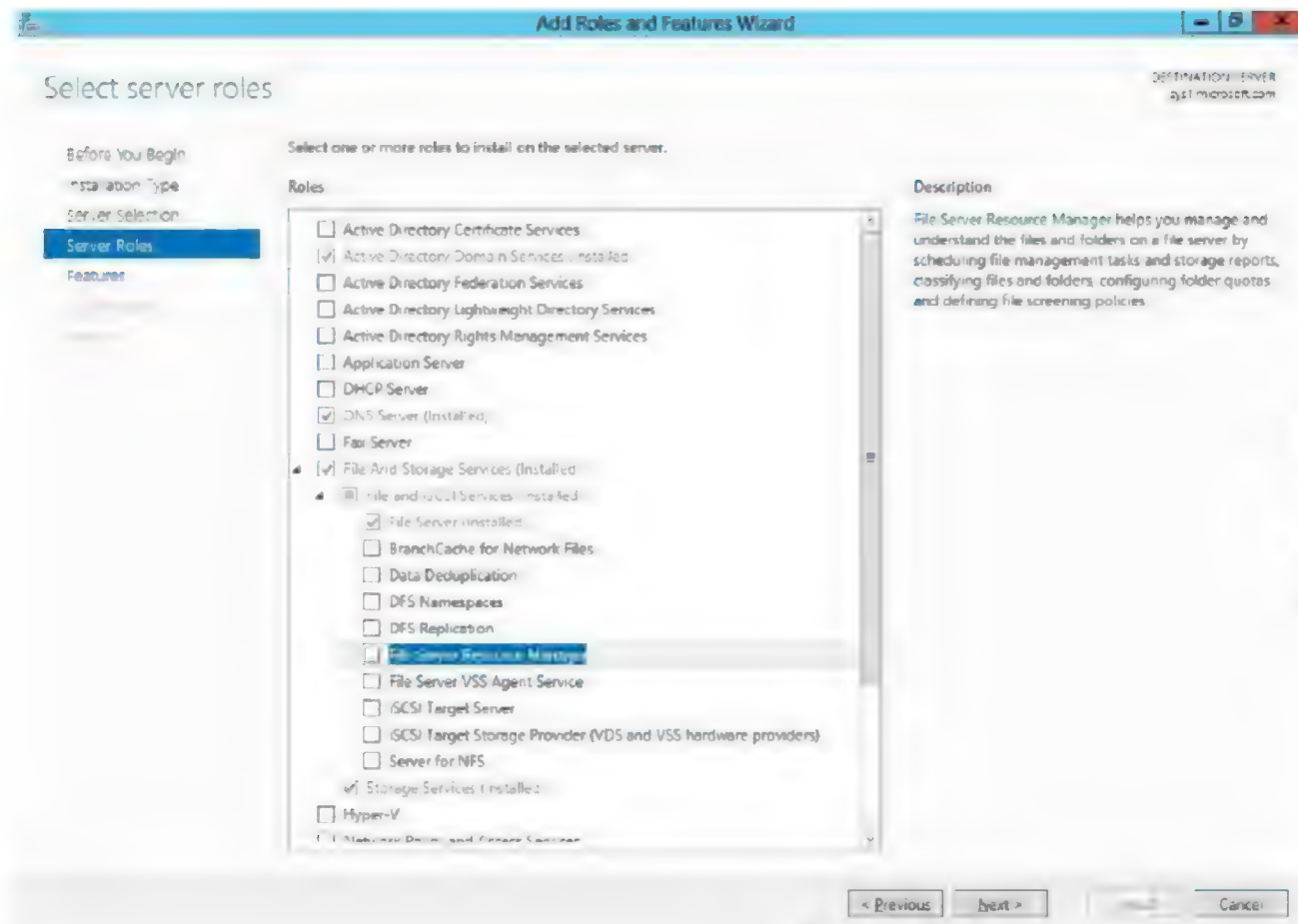
3. In Select installation type, select **Role-based or feature-based installation**, click **Next**.



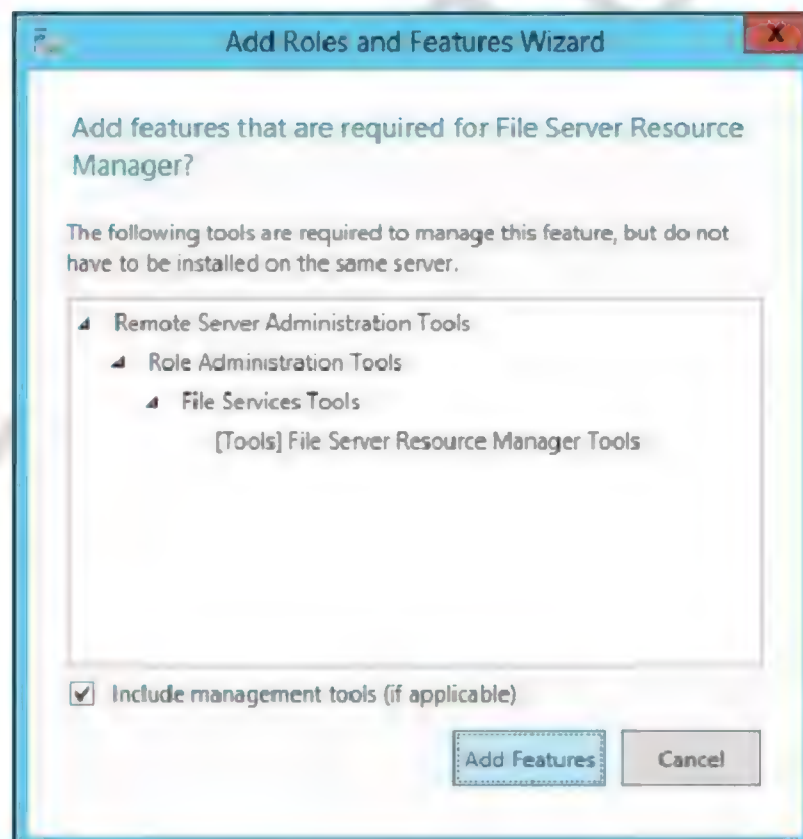
4. In Select destination server, from Server Pool select **SYS1**, click **Next**.



5. In Roles, expand File and Storage Services, expand File and iSCSI Services, check the box **File Server Resource Manager**, click **Next**.

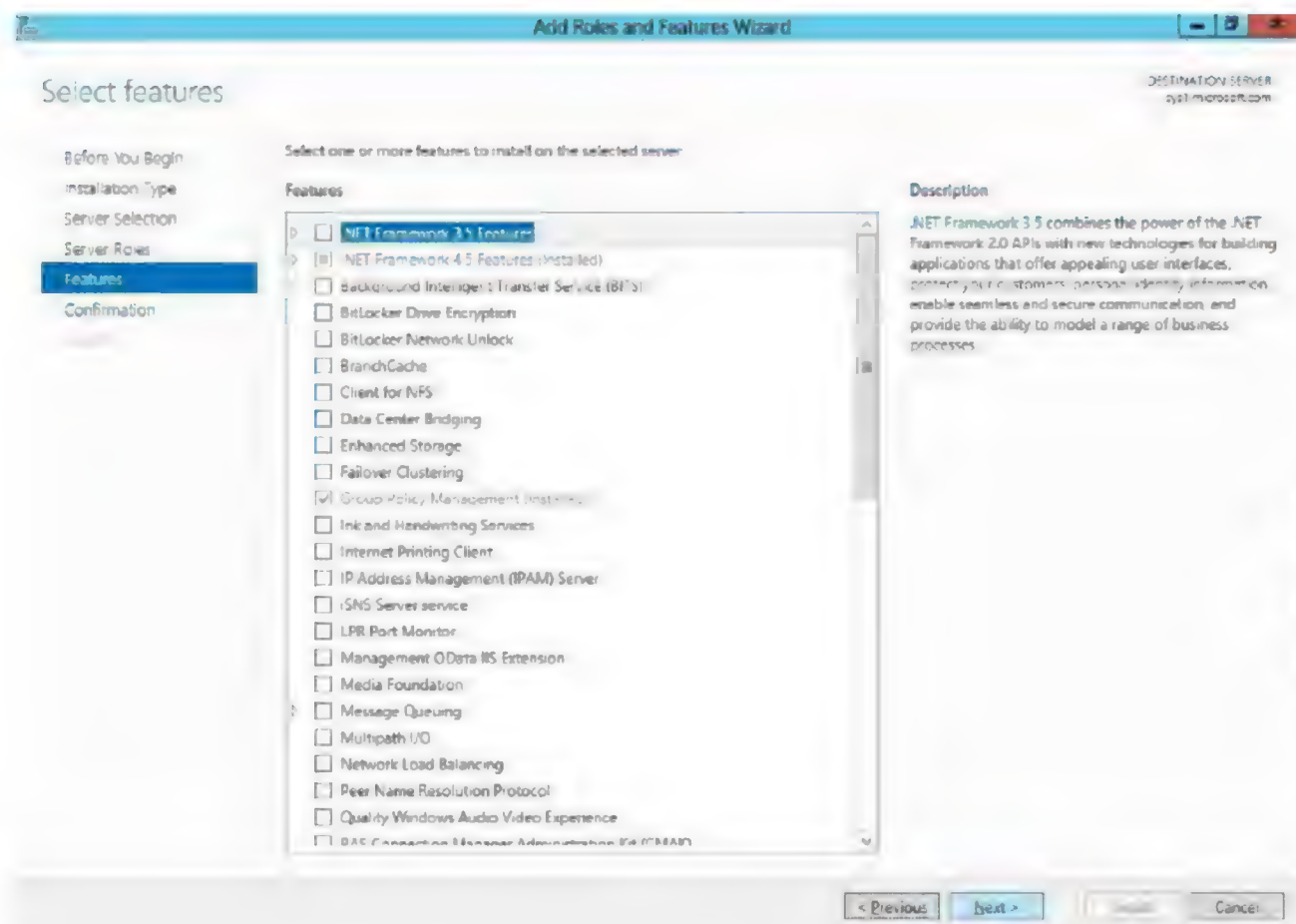


6. Click **Add Features**, to install the required features for Active Directory Domain Services. Click **Next**.

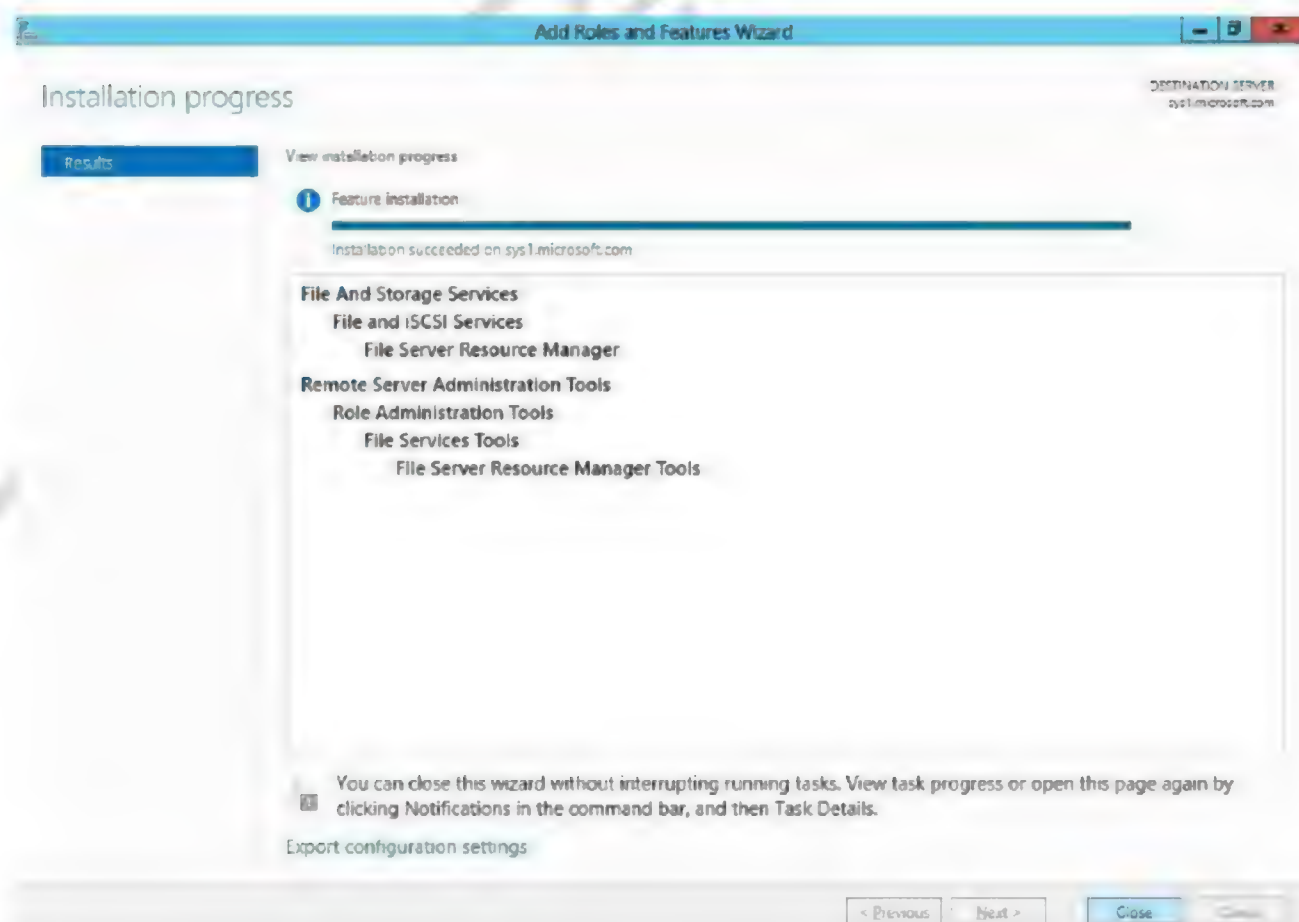




7. In Select features wizard, click **Next**.



8. Check the box **Restart the destination server automatically if required**. Click **Install**.
9. Click **Close**, to complete the installation

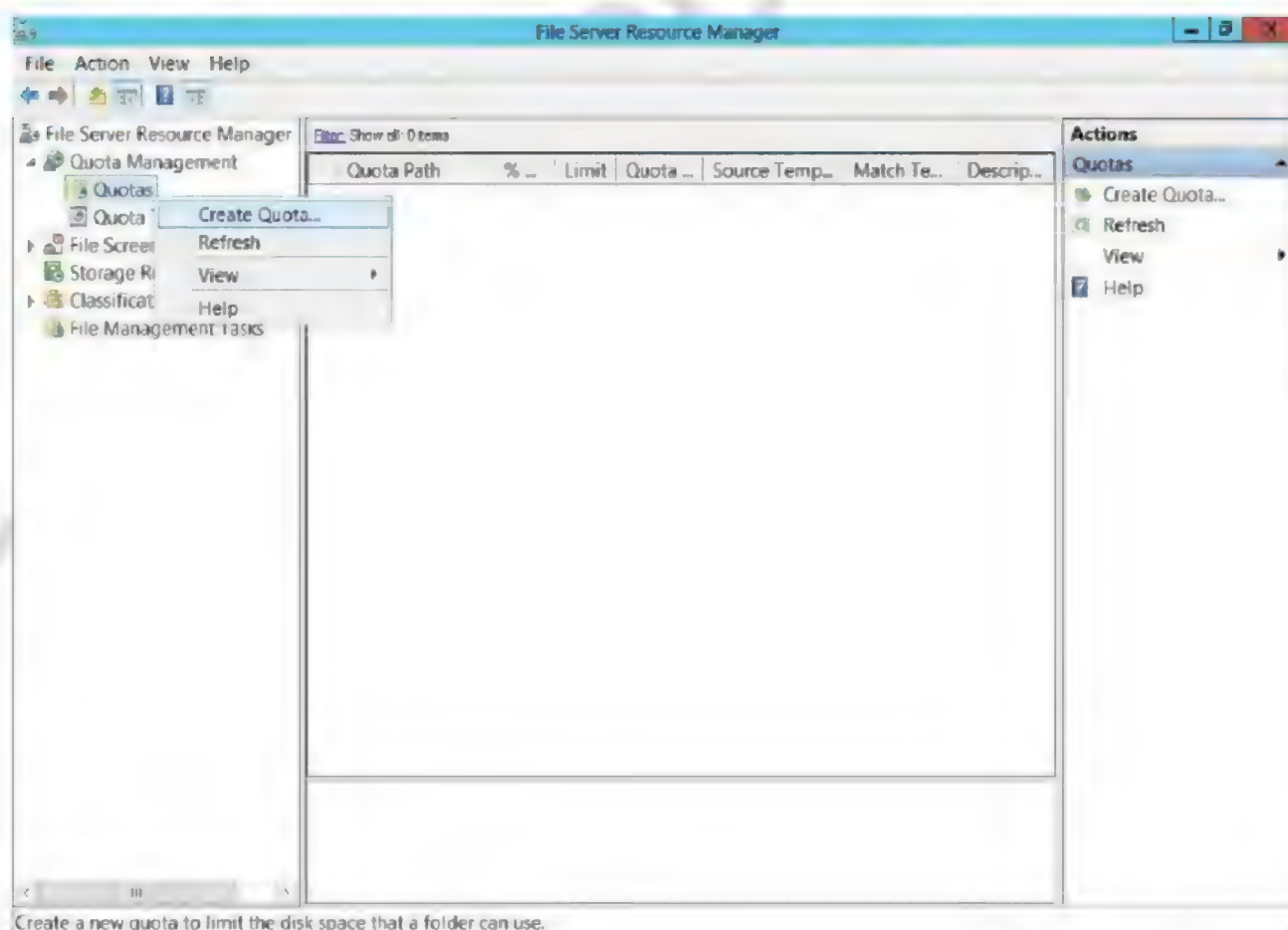


## Configuring Quota Management using FSRM

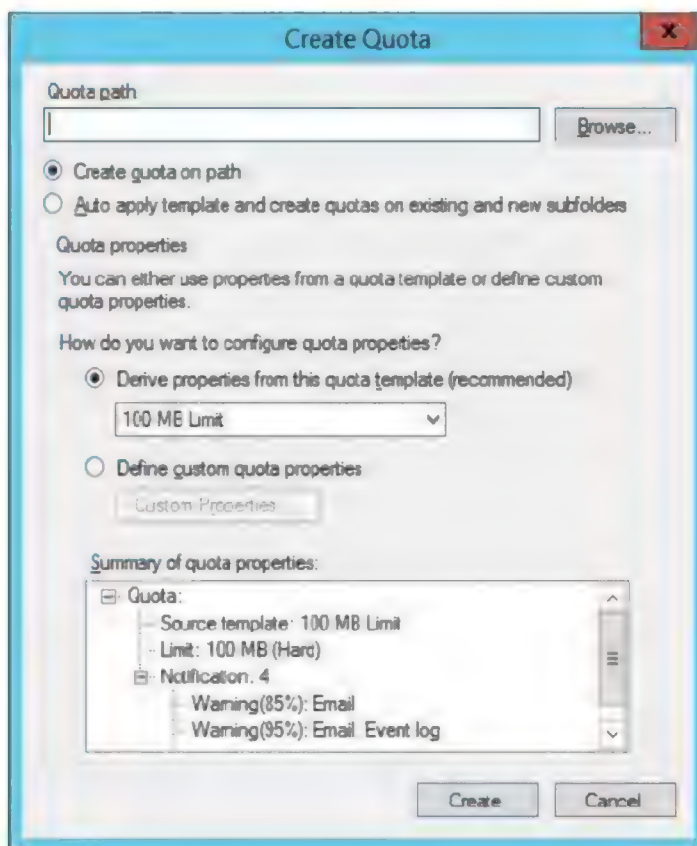
1. Go to Start, select **File Server Resource Manager**.



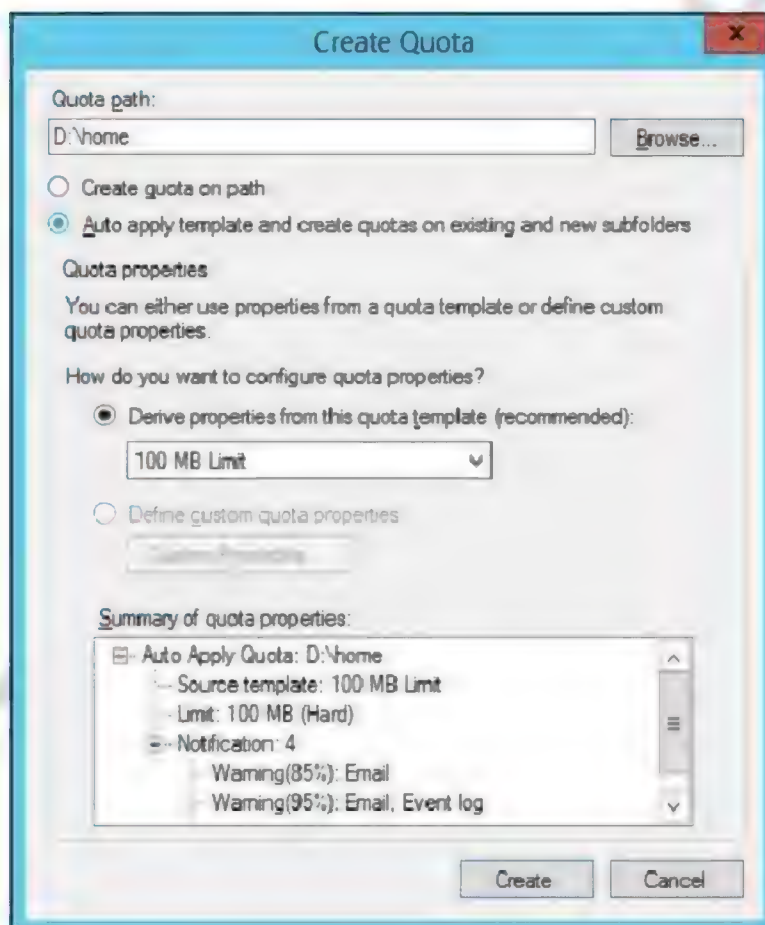
2. Expand Quota Management, right click Quotas, and select **Create Quota**.



- Click **Browse** and Select the Quota path (Ex: D:\Home)



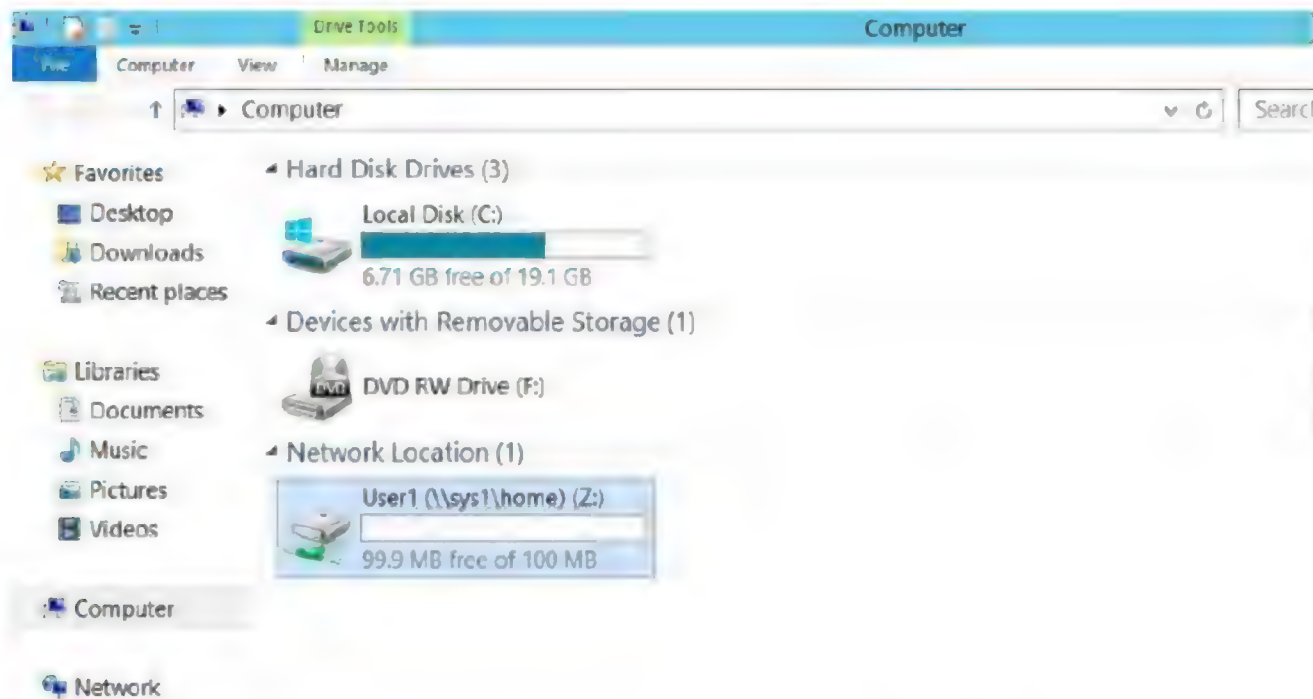
- Select **Auto apply template and create quotas on existing and new subfolders**. Select the limit and click **Create**.





### Verification

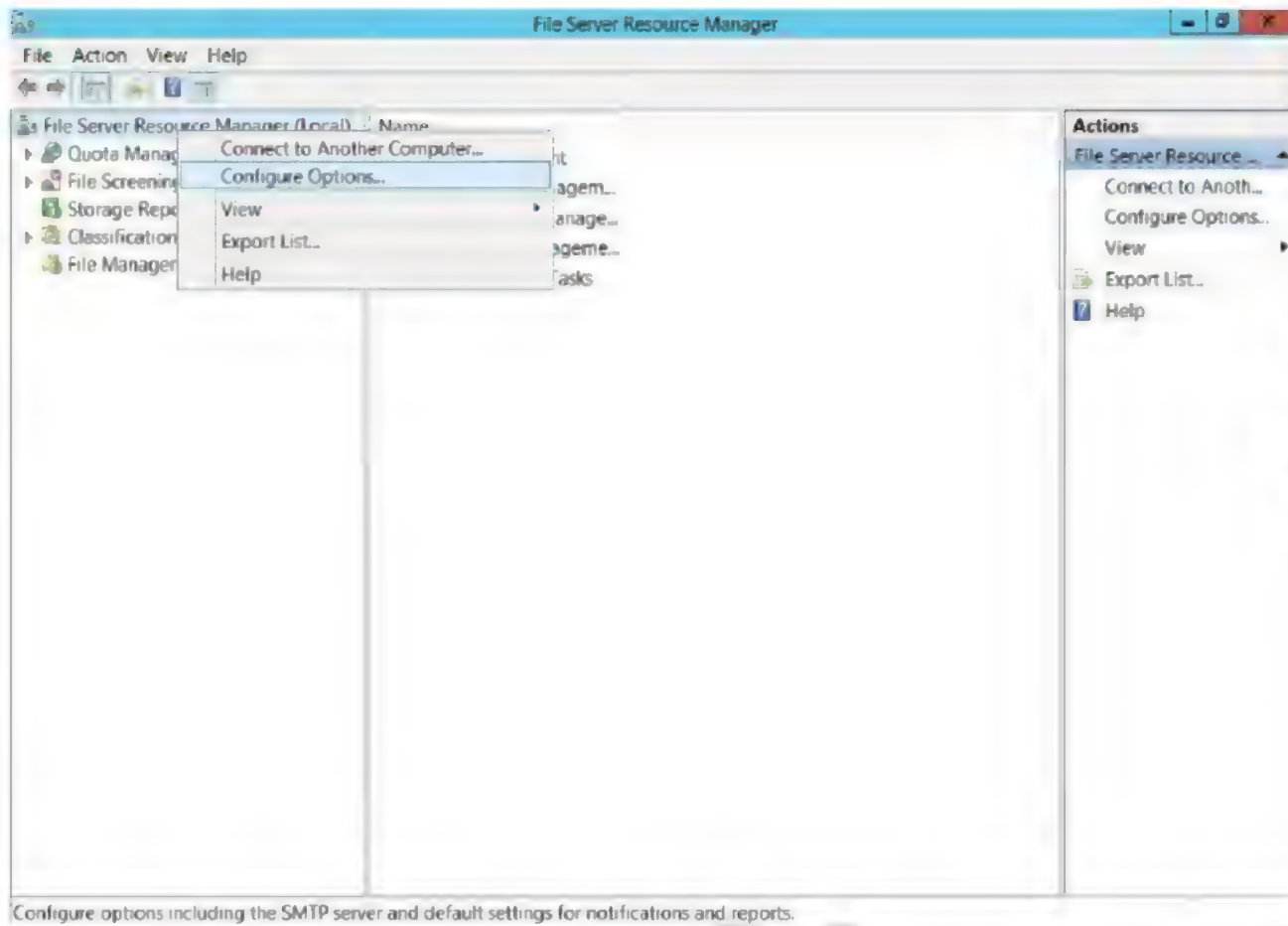
1. Log in as User (**User1**) on Client or Member Server (**SYS2**), Open Computer.
2. Verify the Size of the Network drive Z: (Home Folder).



3. Login as other users and verify the size of the Home Folder.

## Configuring File Screening Using FSRM

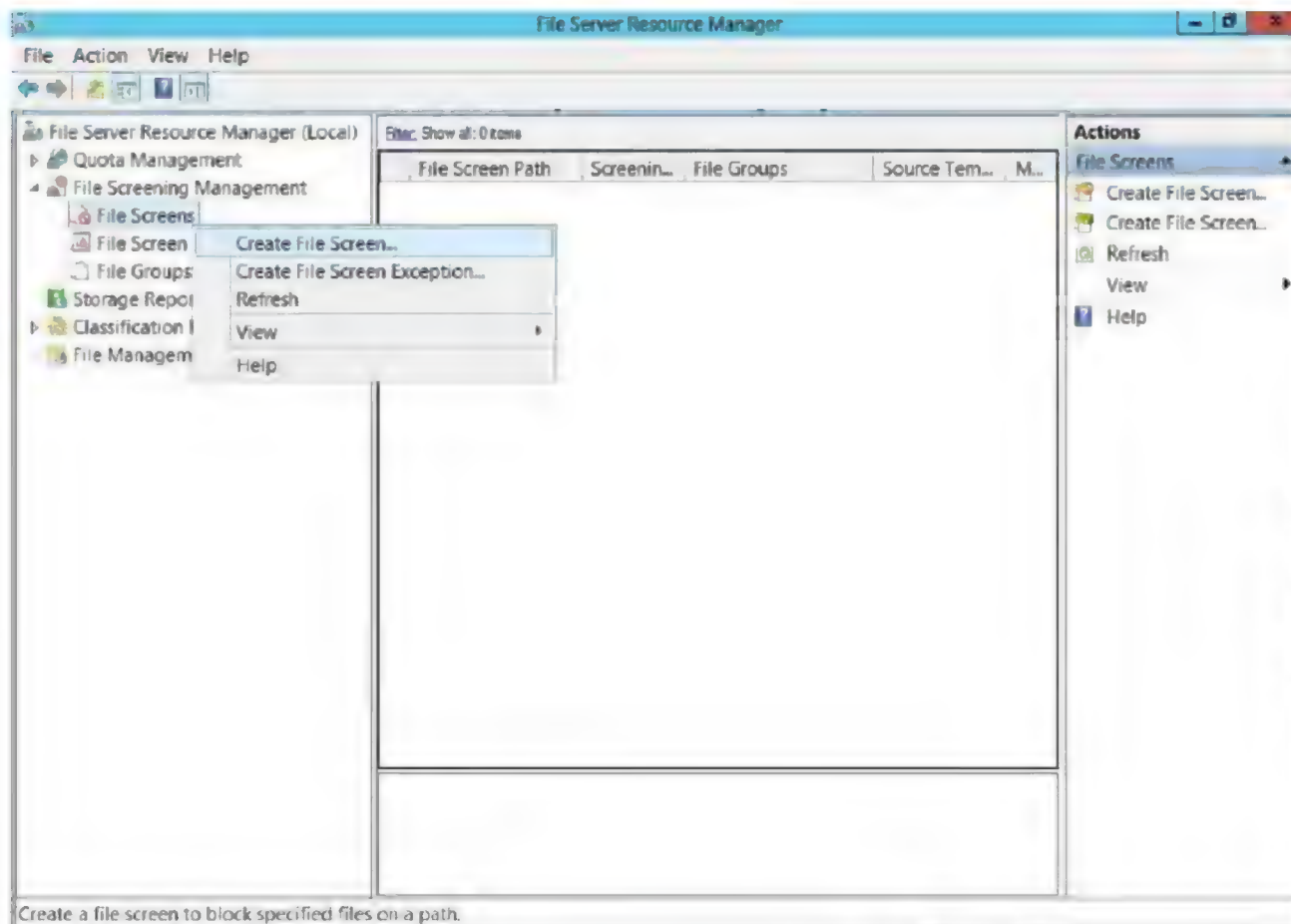
1. Go to Start, File Server Resource Manager; Right click on File Server Resource Manager and select **Configure Options**.



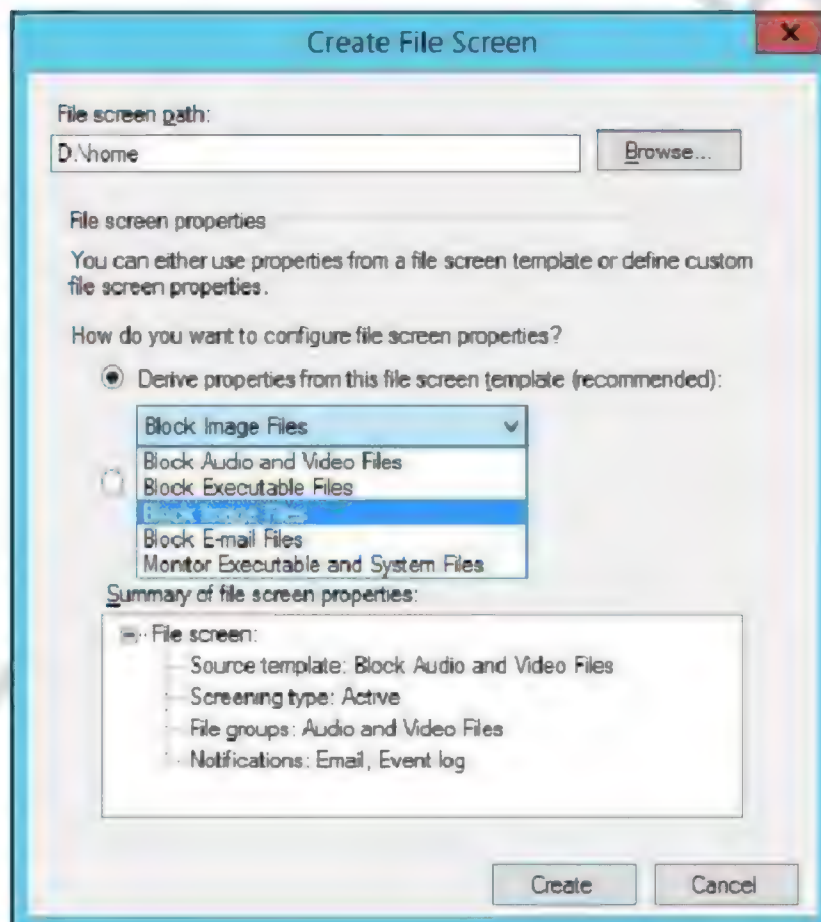
2. Check the box Record file screening activity in auditing database, click **OK**.



- Expand File Screening Management, right click File Screens and select **Create File Screen**.

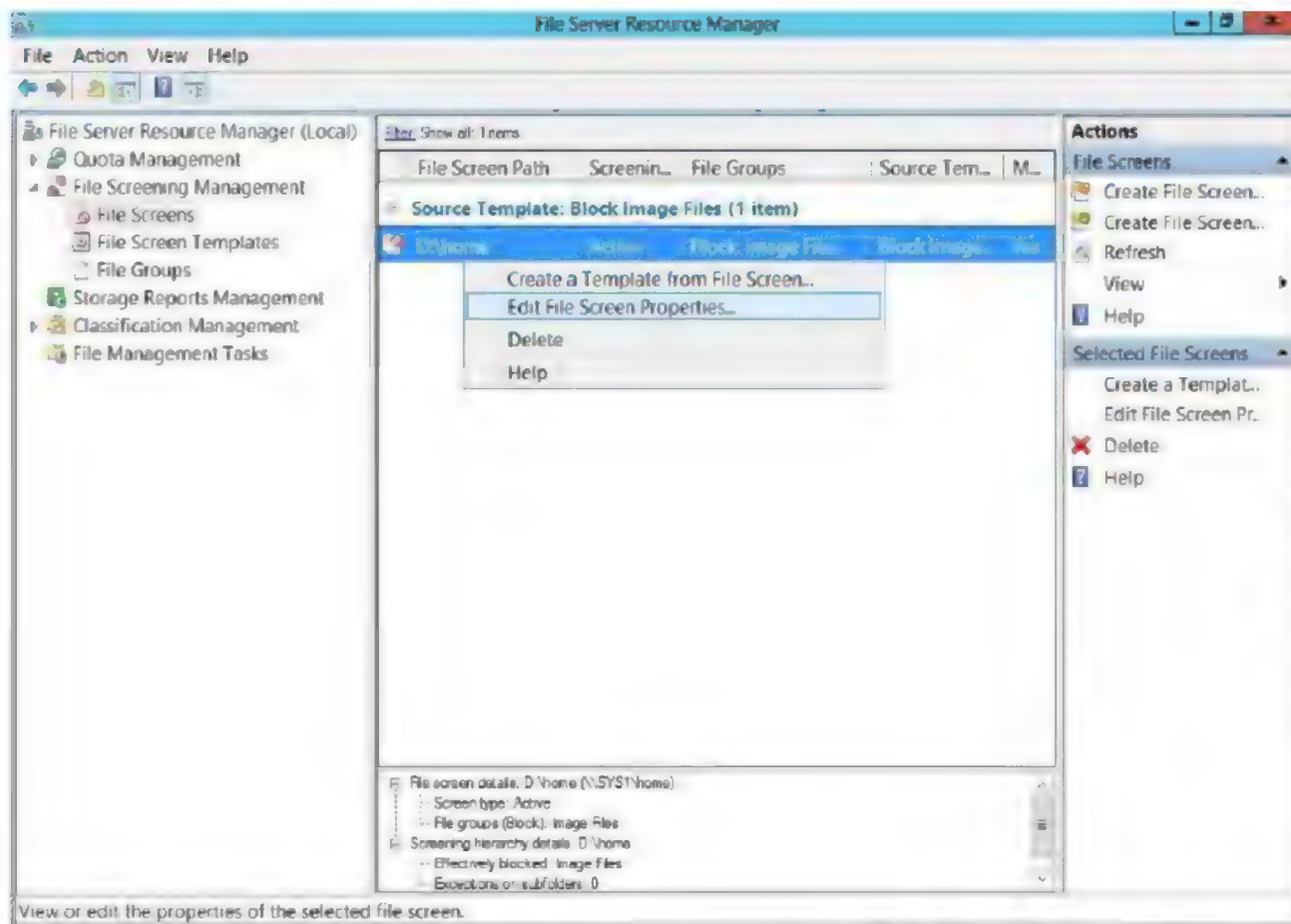


- Click Browse to select the File screen path, select option **Block Image Files**, and click **Create**.

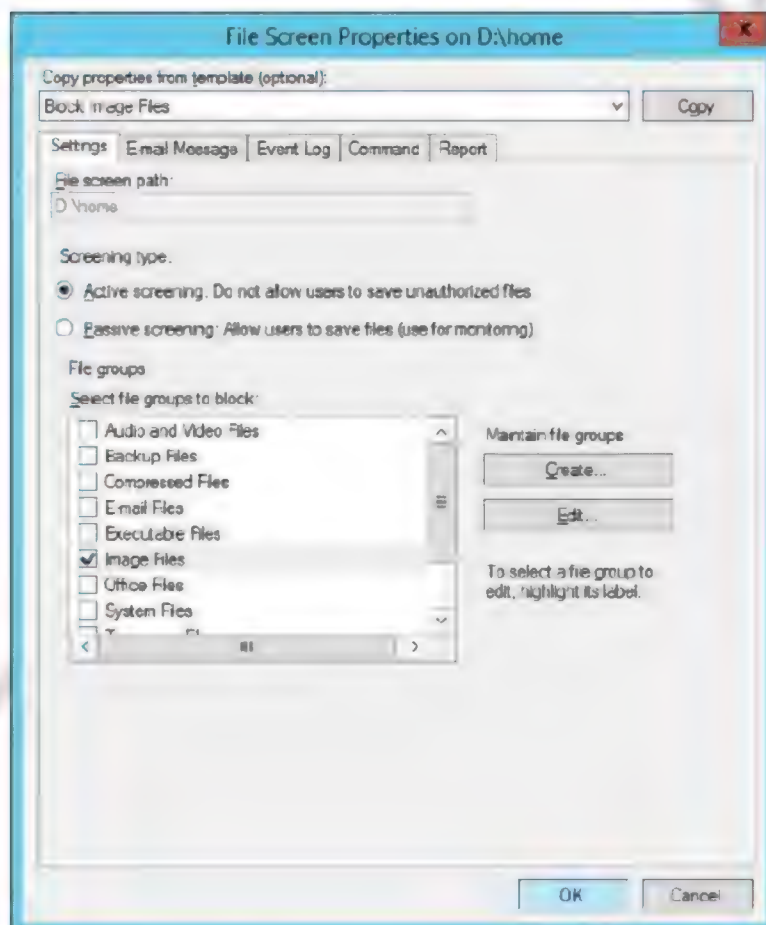




- Right click on the created file screen, select **Edit File Screen Properties**.

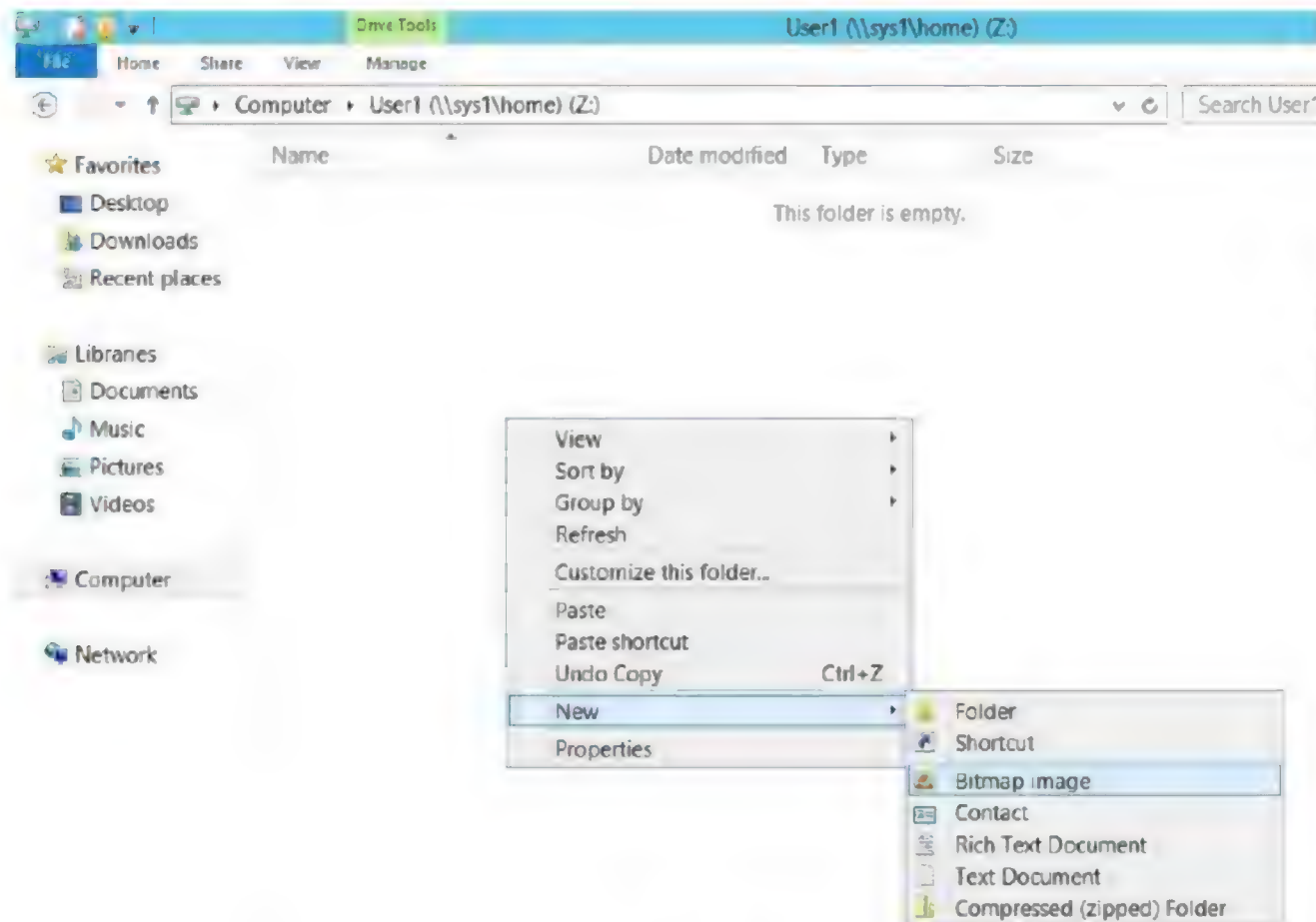


- Select the Screening type Active screening, click **OK**.

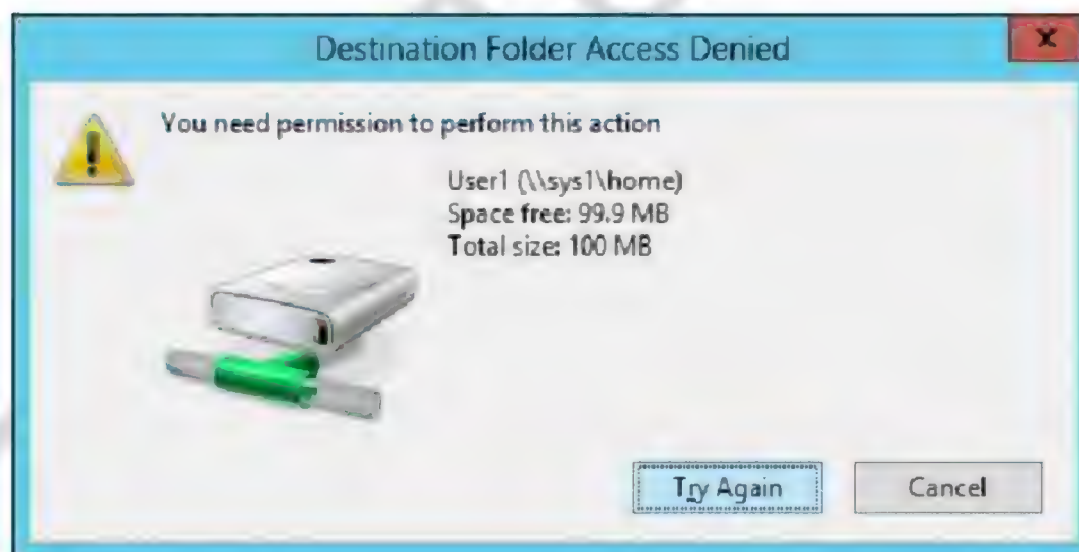


## Verification

1. Log in as User (**User1**) on Client or Member Server (**SYS2**),
2. Open Computer, Network drive Z: (Home Folder) and try to create a **New Bitmap Image file**.

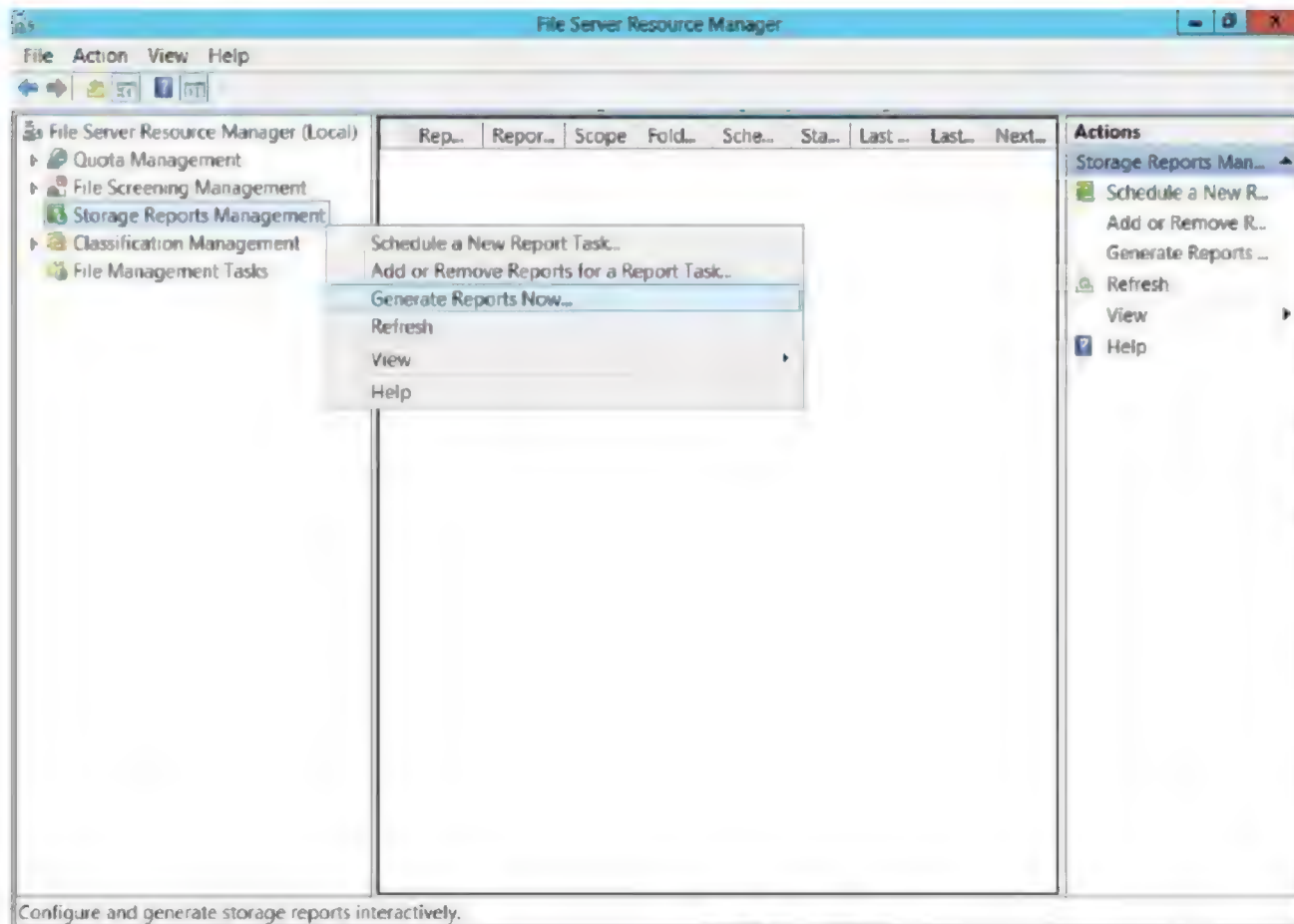


3. Verify for Access Denied Page.

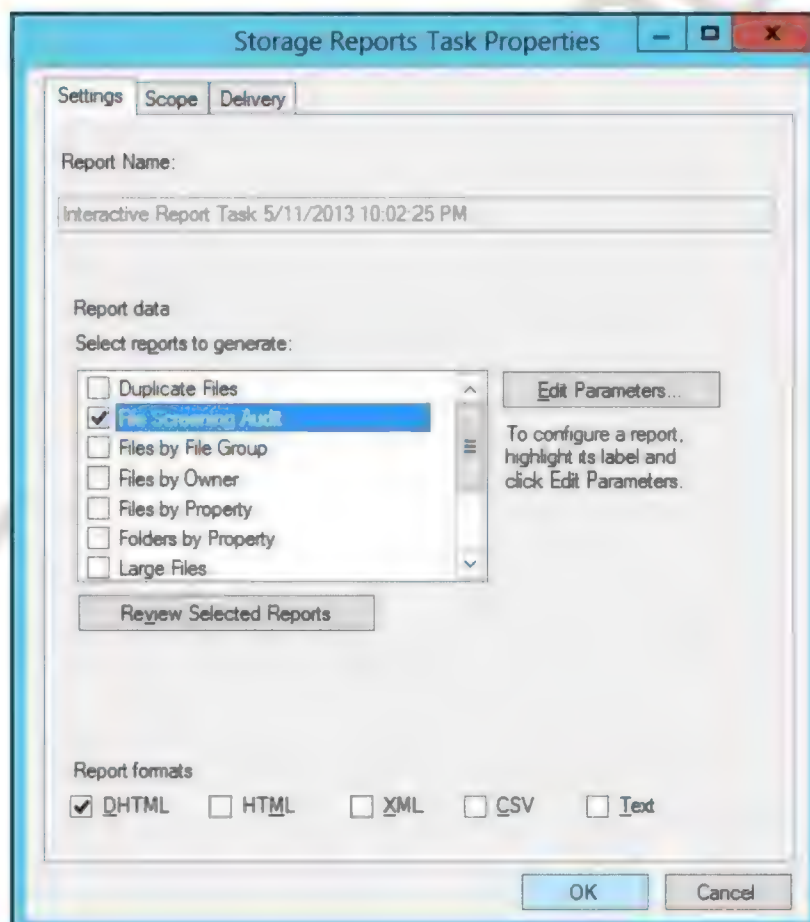


## Configuring Storage Reports Management using FSRM

1. Go to Start, File Server Resource Manager, right click Storage Reports Management and select **Generate Reports Now**.

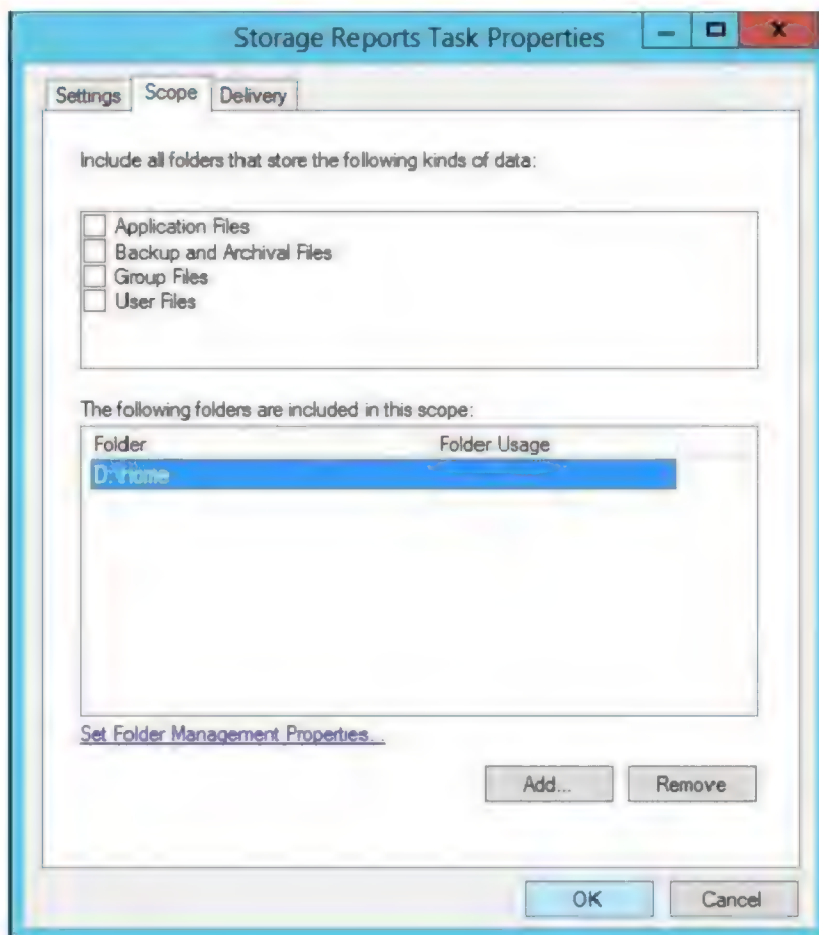


2. In settings page, check box **File Screening Audit**.





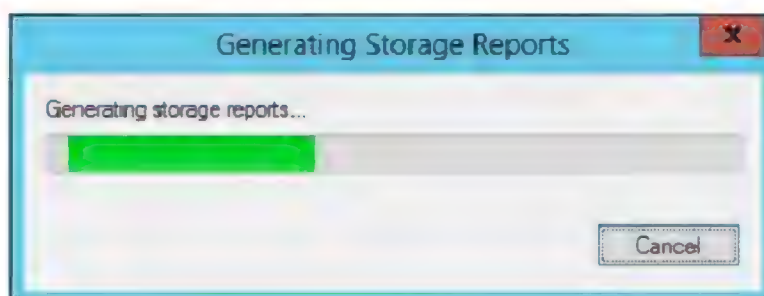
3. Select Scope, click **ADD** and select the home folder (Ex: D:\Home).



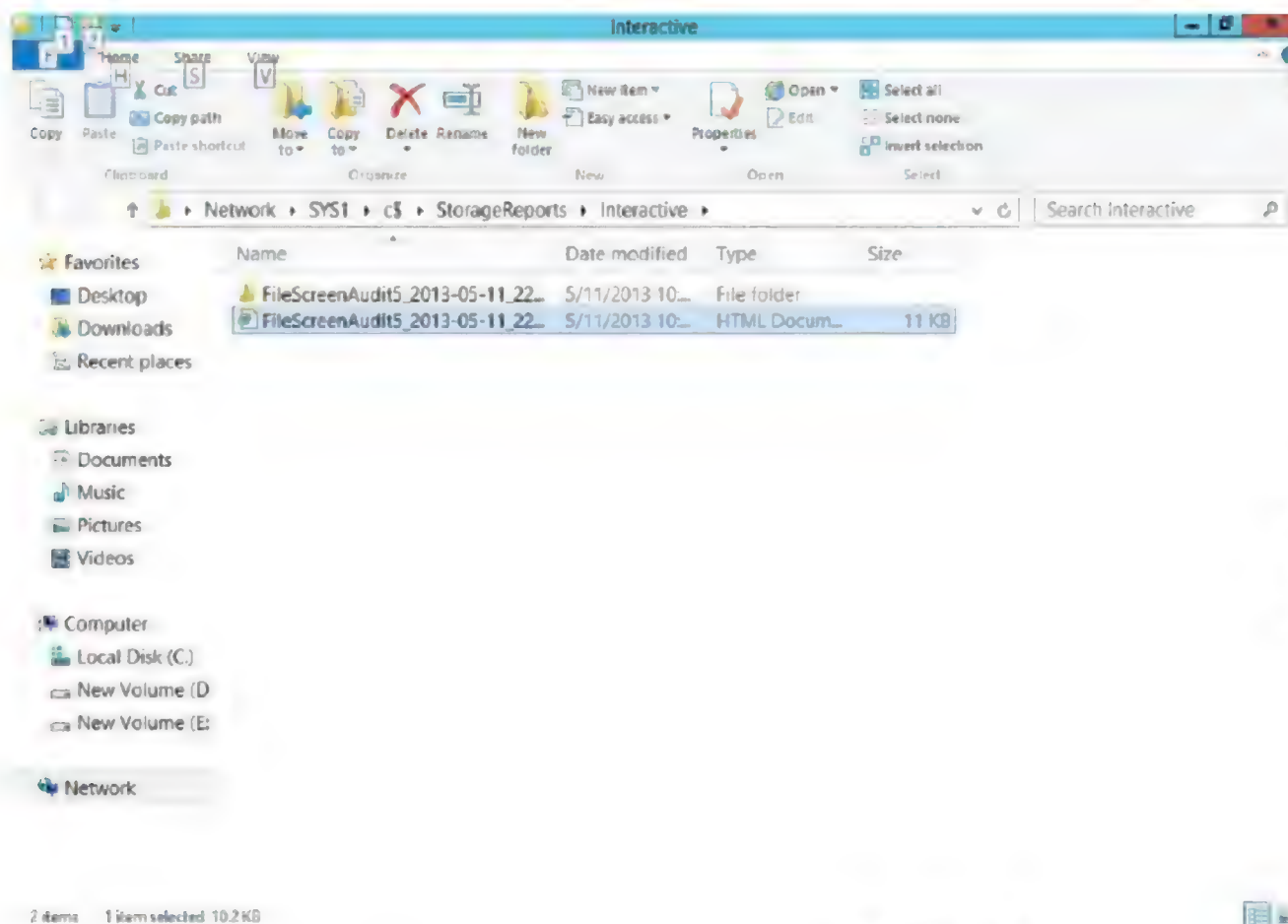
4. Select Wait for reports to be generated and then display them, click **OK**.



5. It Generates the Storage Reports



6. Select the File Screening Audit Report and Open the report.



7. Verify the Report for Blocked image file creation by the users.



## Lab – 22: Creating an Organizational Unit (OU)

### Objective:

To create OU's to organize AD objects according to departments

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



SYS1		SYS2	
Domain Controller		Member Server / Client	
IP Address	10.0.0.1	IP Address	10.0.0.2
Subnet Mask	255.0.0.0	Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1	Preferred DNS	10.0.0.1

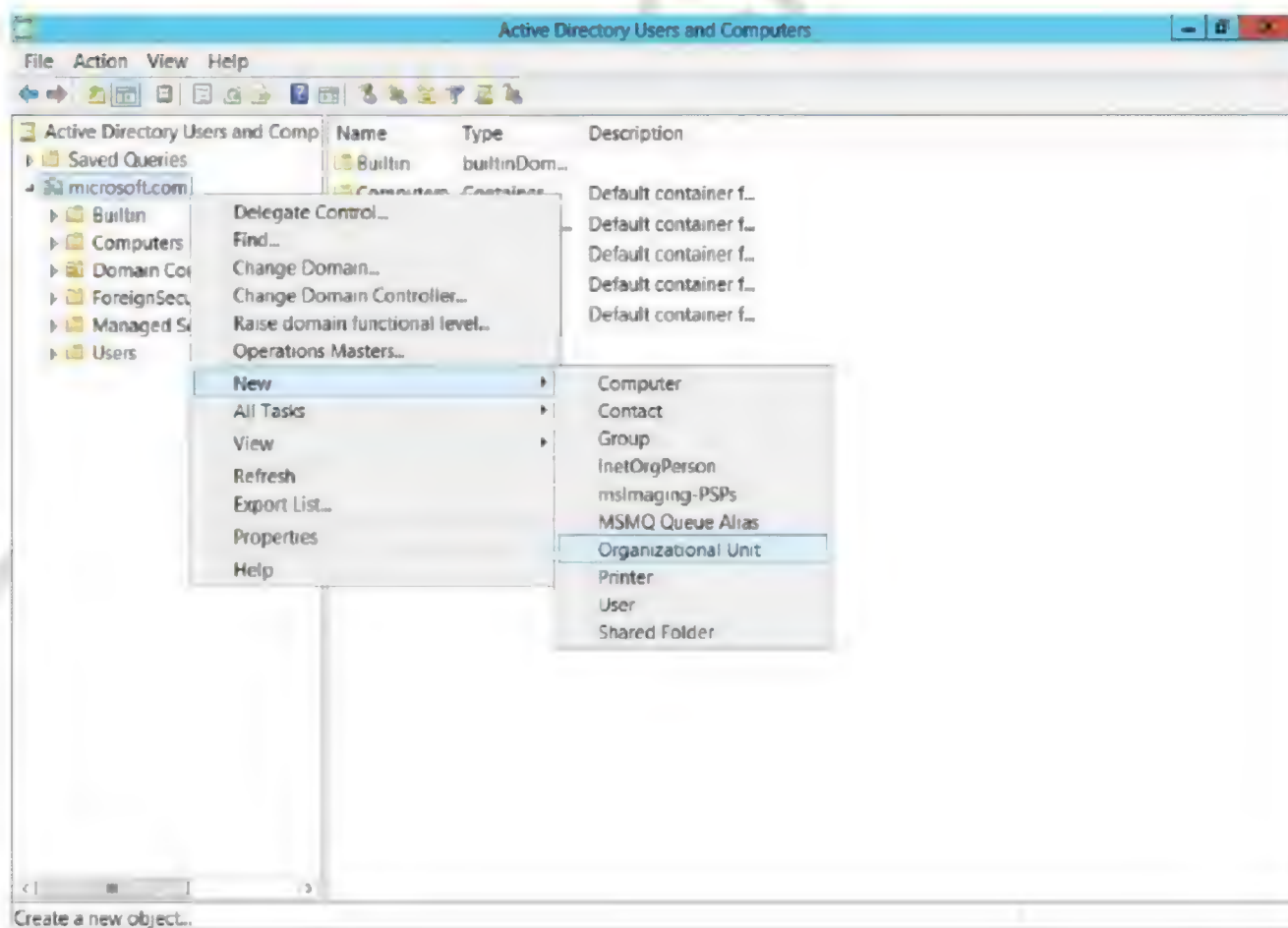


**Steps:**

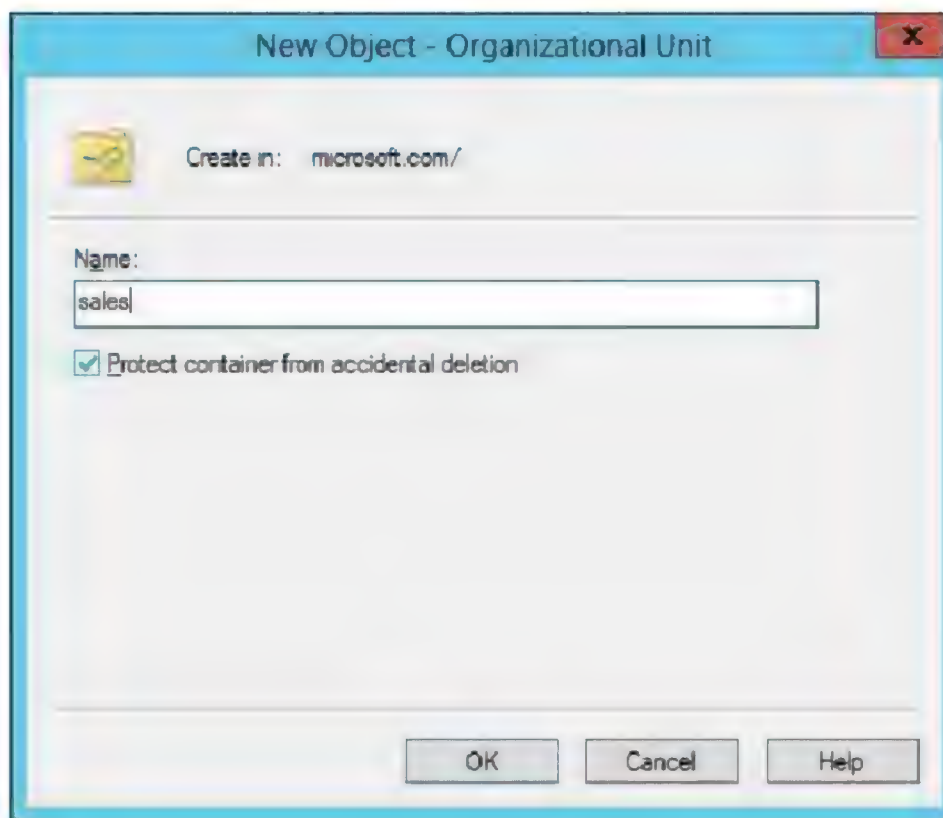
1. Press Windows Key to go to Start, select **Active Directory User and Computers**.



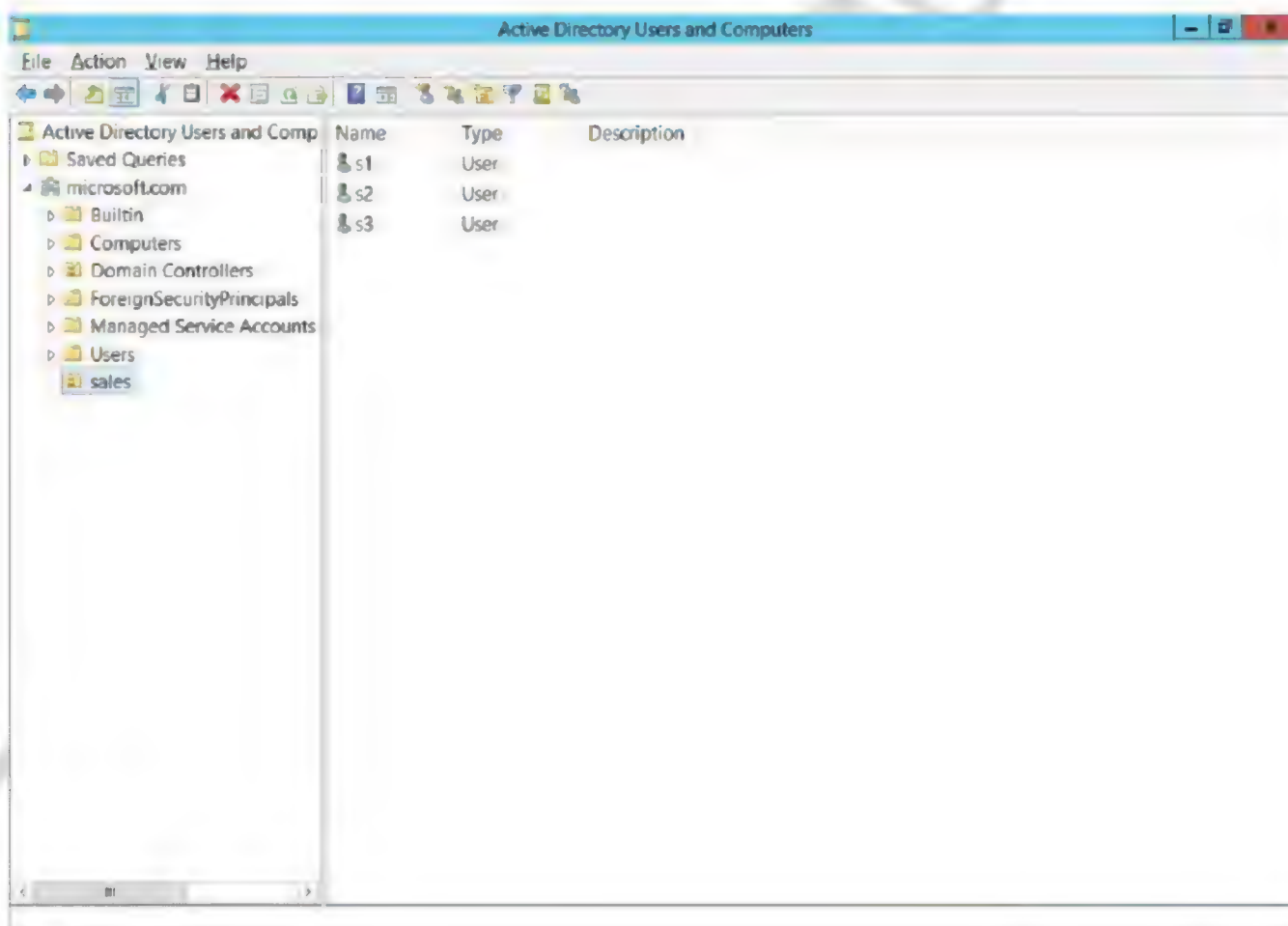
2. Right click **DomainName**→**New**→**Organizational Unit**.



- Enter the name for OU (Ex: **Sales1**) and click **OK**.



- Create **Users** in the **Sales1** OU (Ex: **S1, S2, S3**)



## Lab – 23: Delegating Control to a User

### Objective:

To give administrative privileges to a user on a ou

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

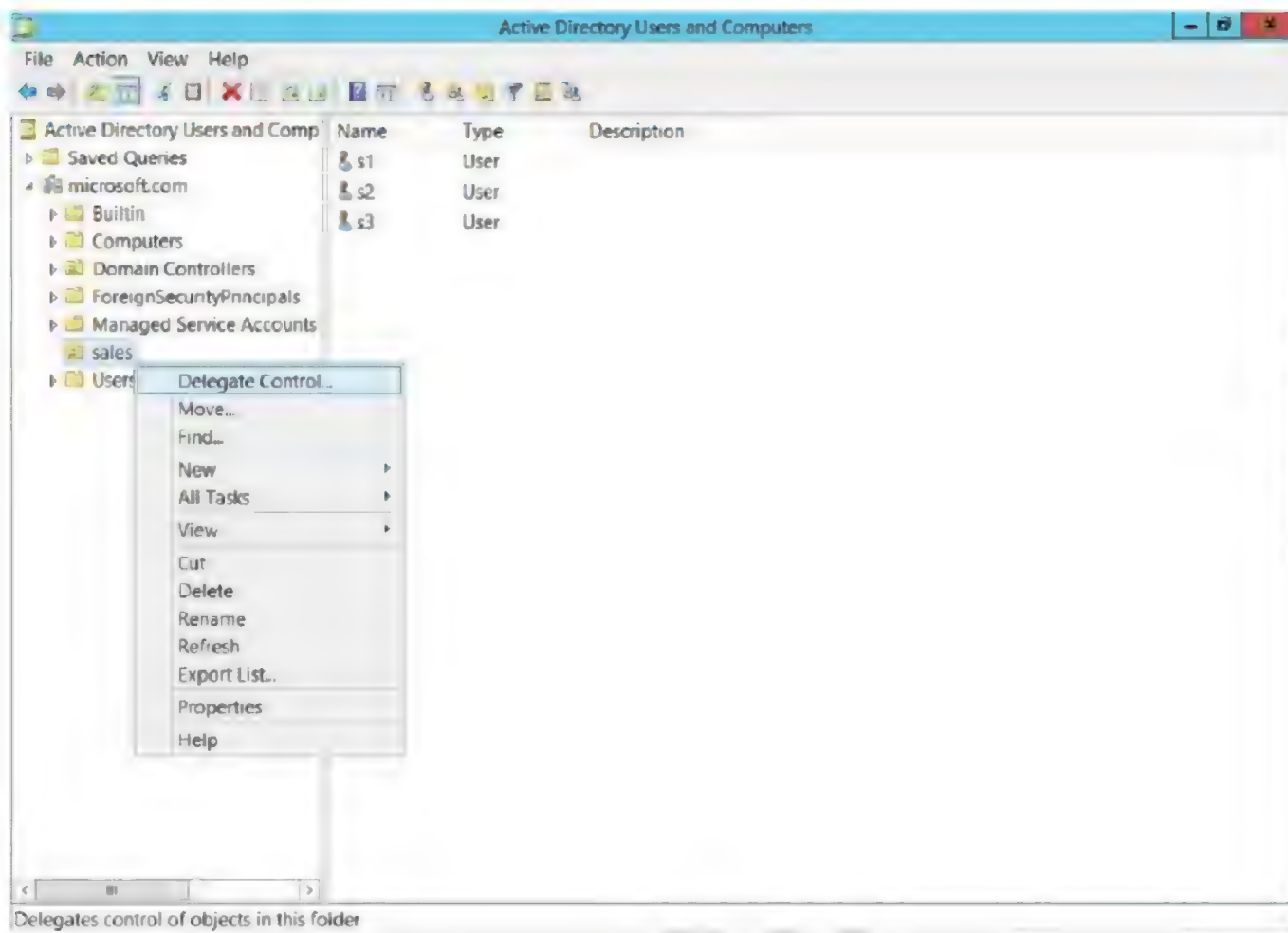
##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1



**Steps:**

1. Go to Active Directory Users and Computers → right click OU → select **Delegate Control**



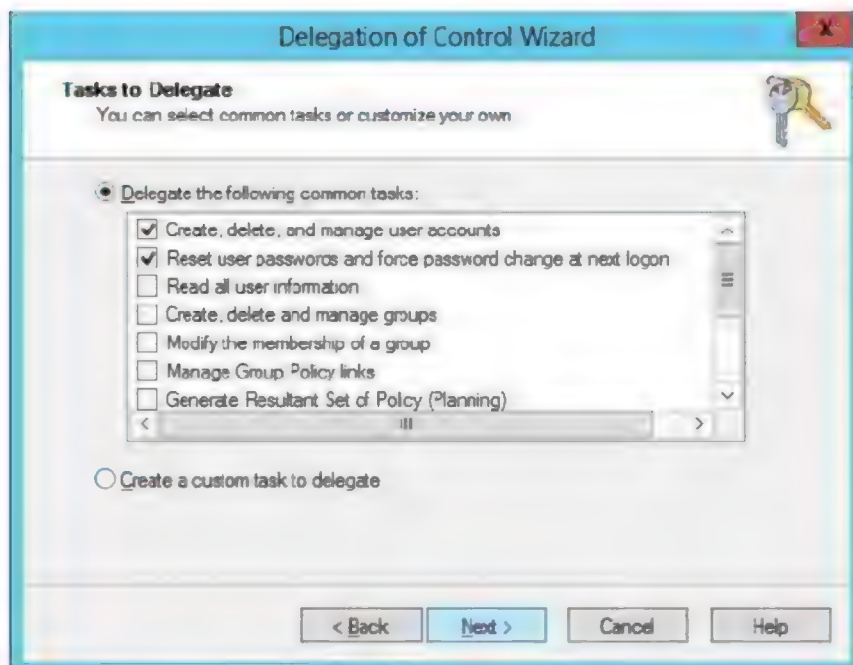
2. Click **Next**.



- Click **Add** → Add the User (User1).



- Check the Box **Create, delete and manage user accounts** and **Next**.



- Click **Finish**.



**Verification:** Log on to D.C as User (User1), Create User in OU.

## Lab – 24: Creating Groups

### Objective:

To create security groups for permissions

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

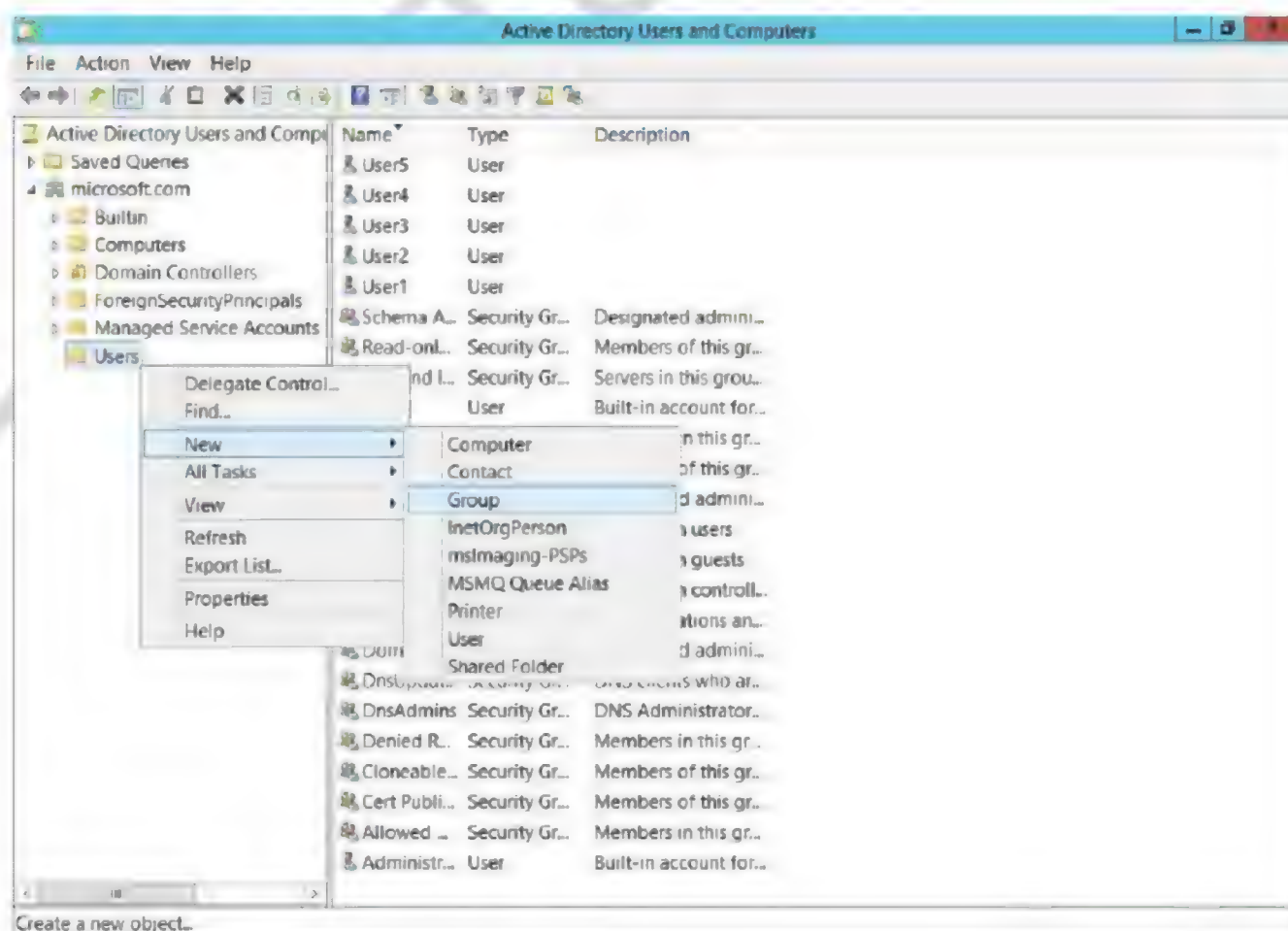


**Steps:**

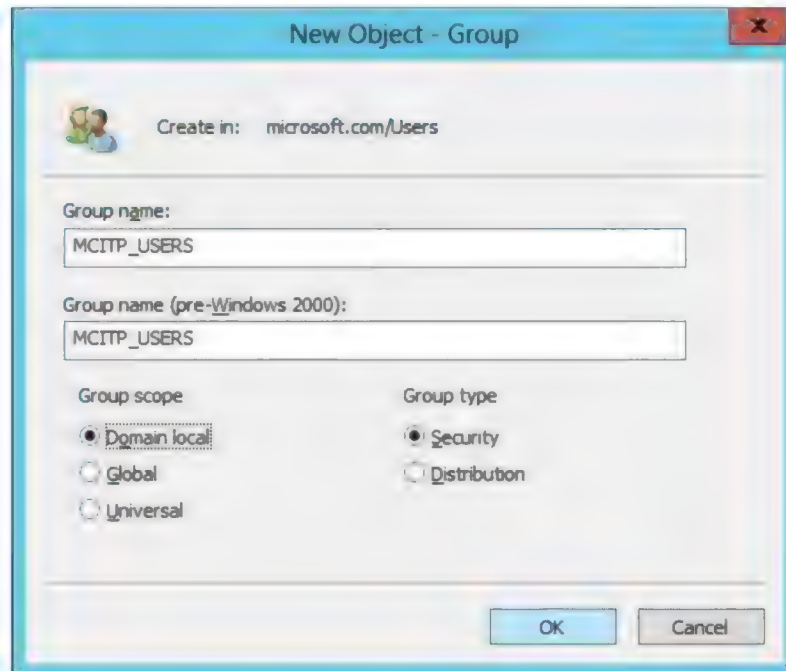
1. Login as **Administrator** on a **Domain Controller**.
2. Go to Start, select **Active Directory Users and Computers**.



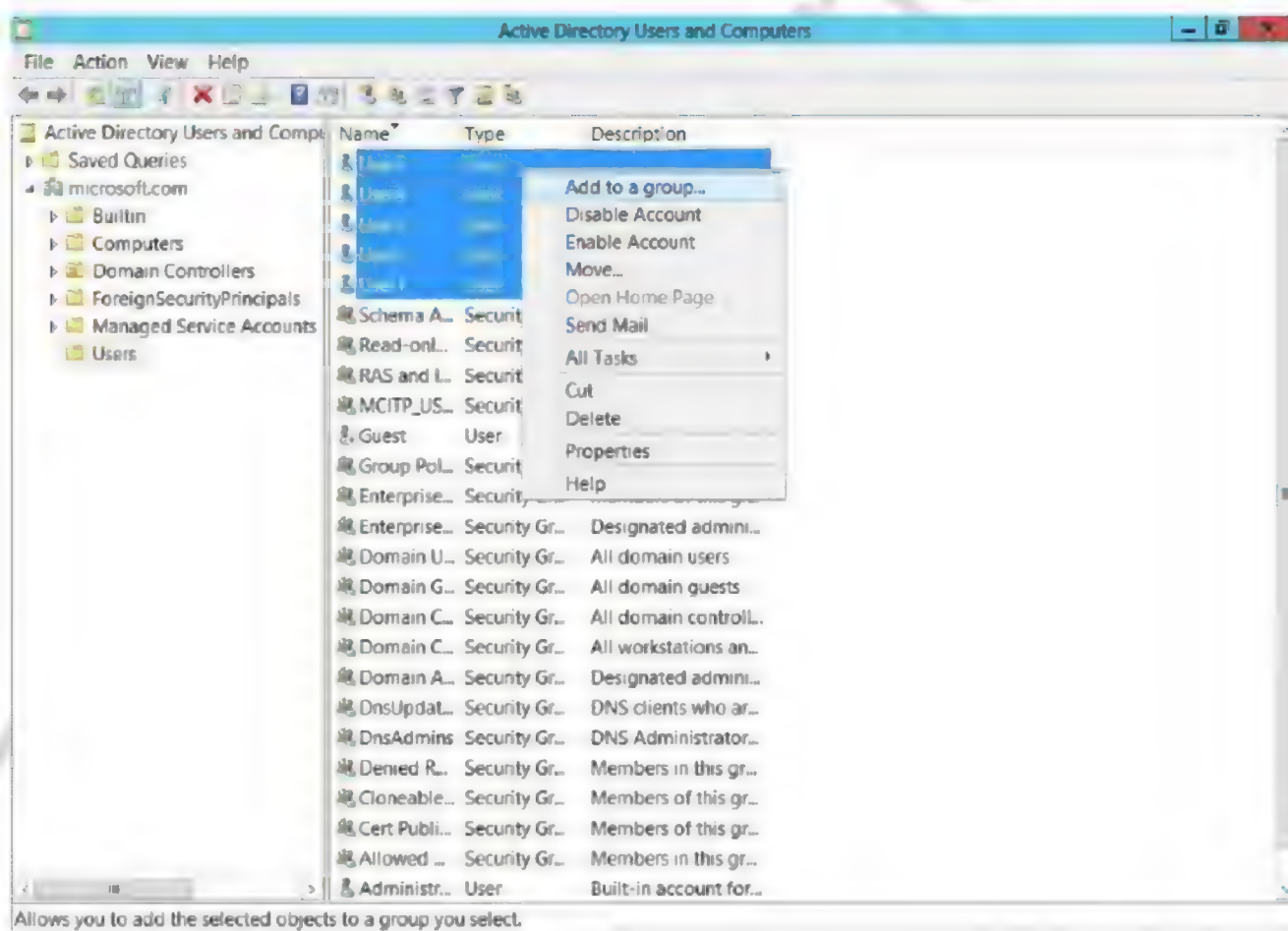
3. Right click **Users** → Select **New** → **Group**.



4. Mention the **Group name** and Select the Group Scope as **Domain Local** and Group type as **Security**.

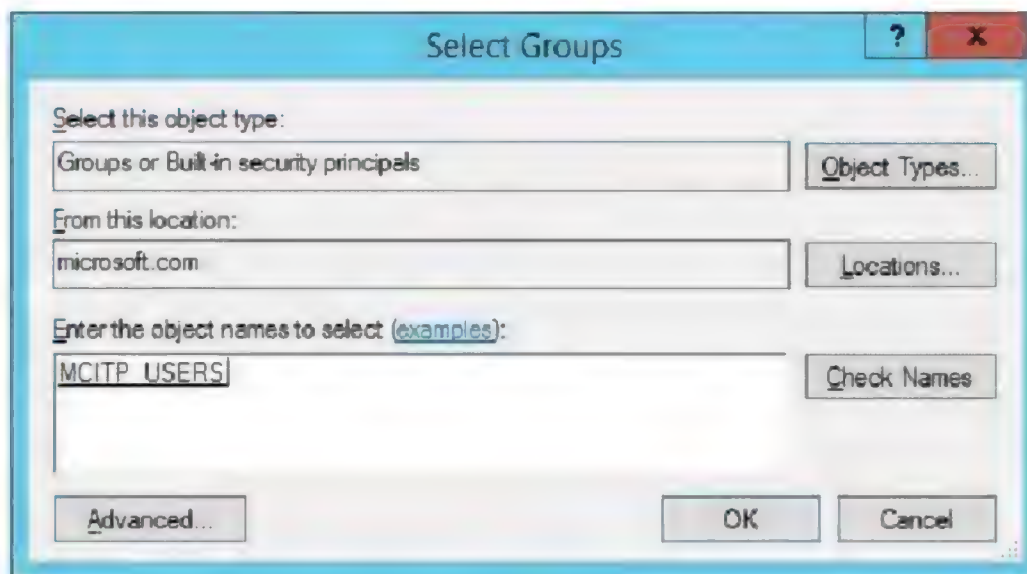


5. Group will be created successfully.
6. To add any users to this group, Right click on User account and Select **Add to a group**

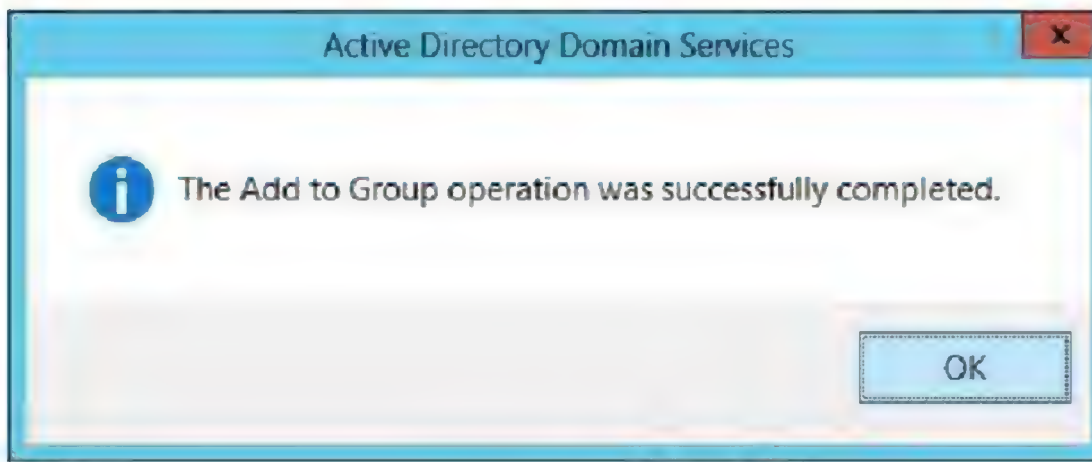




7. Mention the group name as **MCITP\_USERS** → click **OK**.

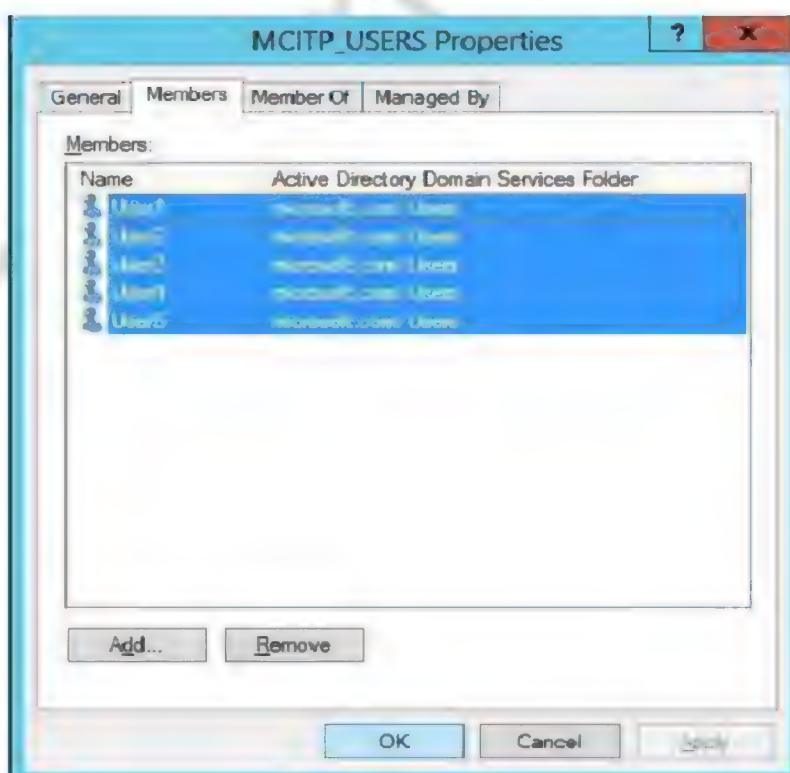


8. Add to Group operation was successfully completed.



**Verification:**

1. Go to **Active Directory Users and Computers** → Right click on **Group** → Select **Properties** → Select **Members** Tab → **Verify for the User**.





## Lab – 25: Installing and configuring DISRIBUTED FILE SYSTEM

### Objective:

To configure namespaces and new folders using DFS to manage share folders

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

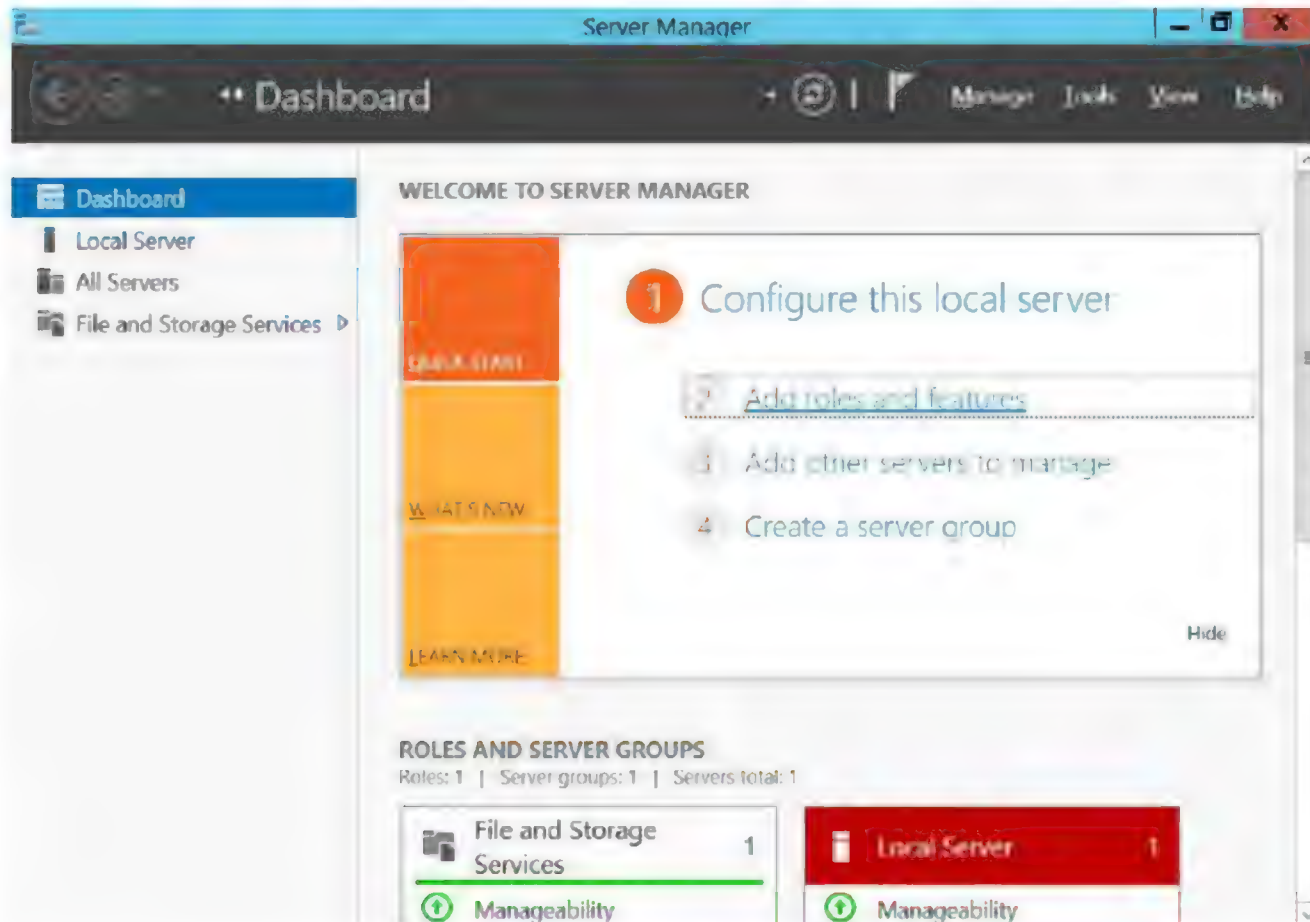
#### SYS2

##### Member Server

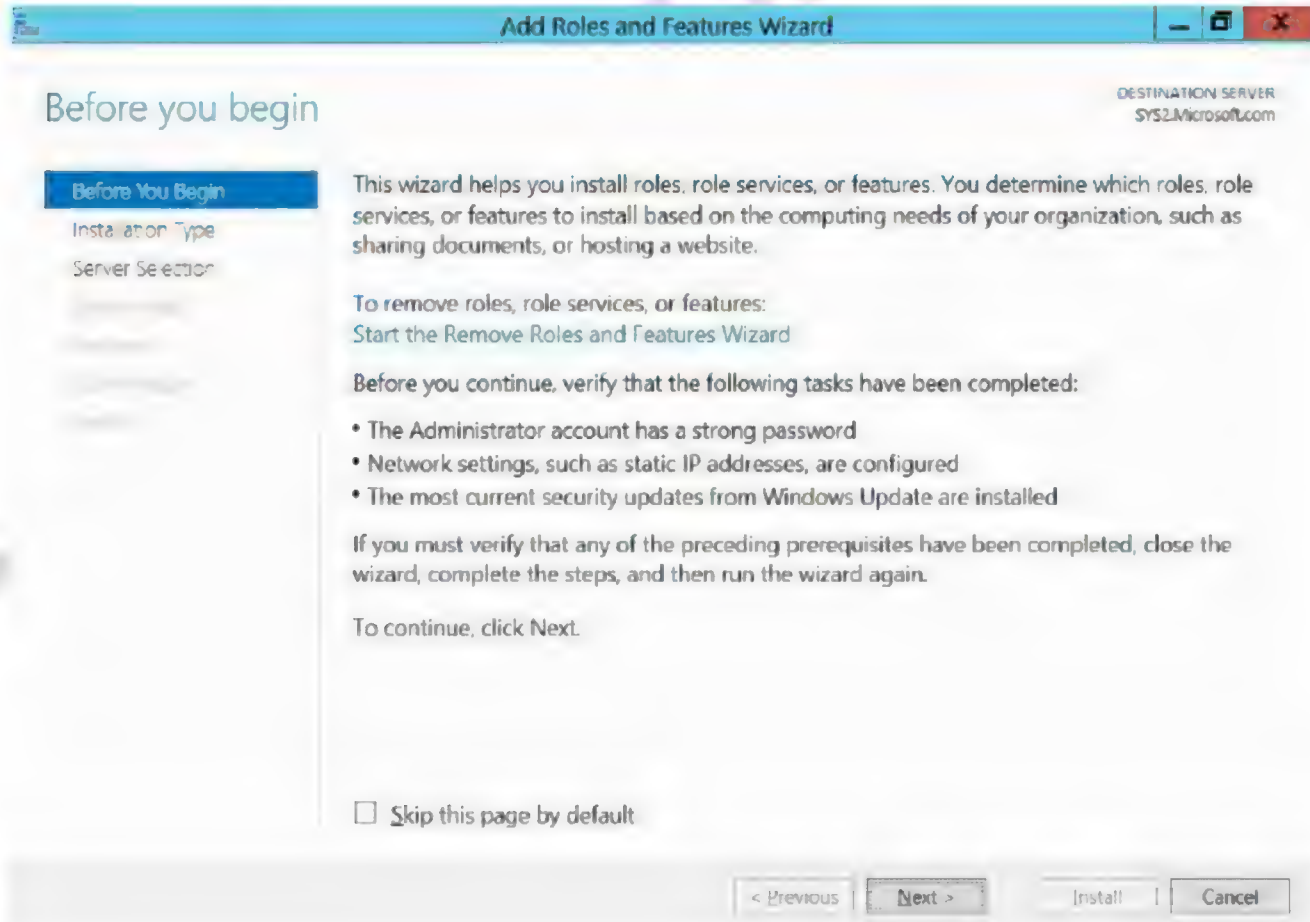
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

## Installing Distributed File System (DFS)

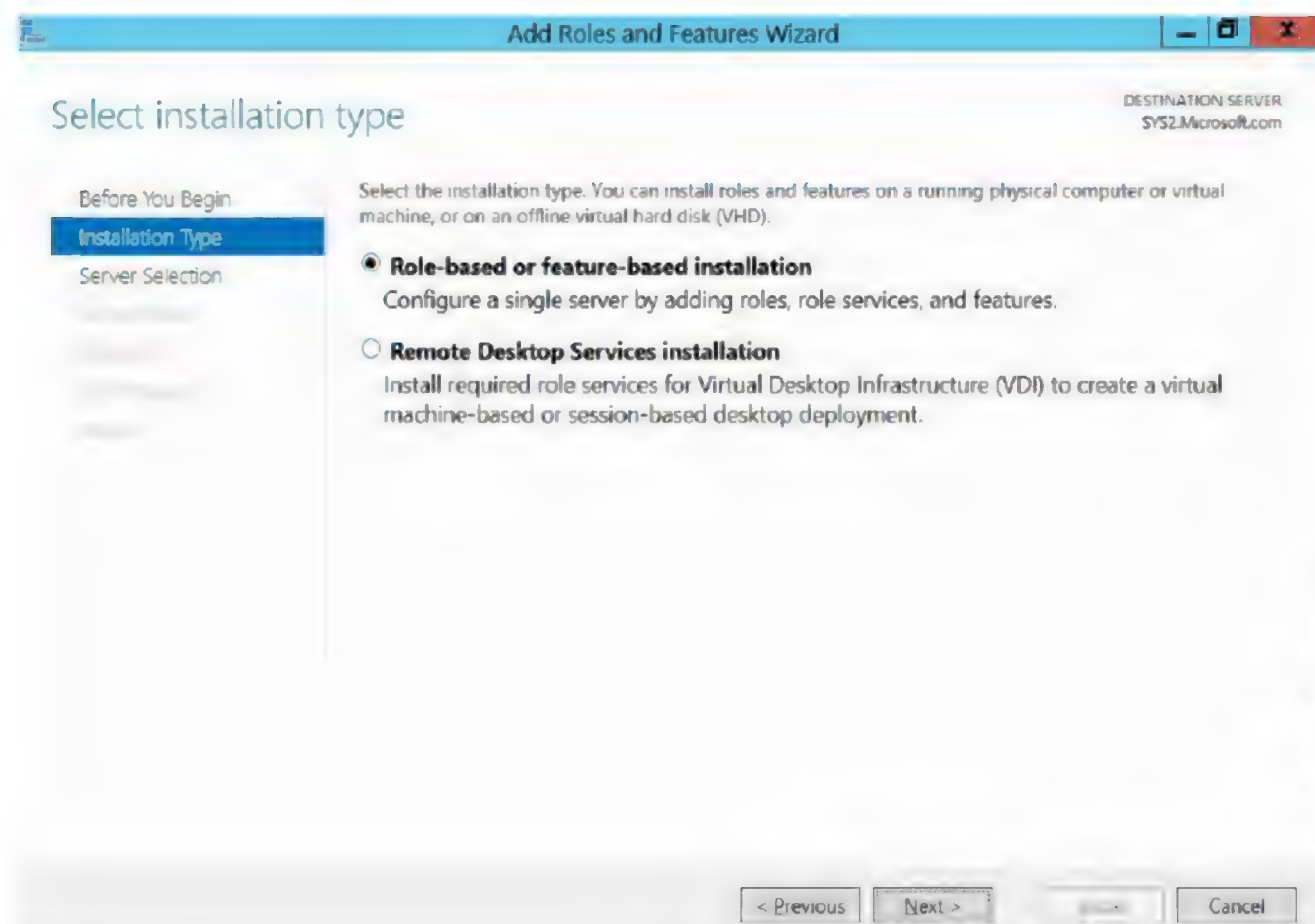
1. In **SYS2 (Member Server)**, Go to **Server Manager**. Click **Add roles and features**.



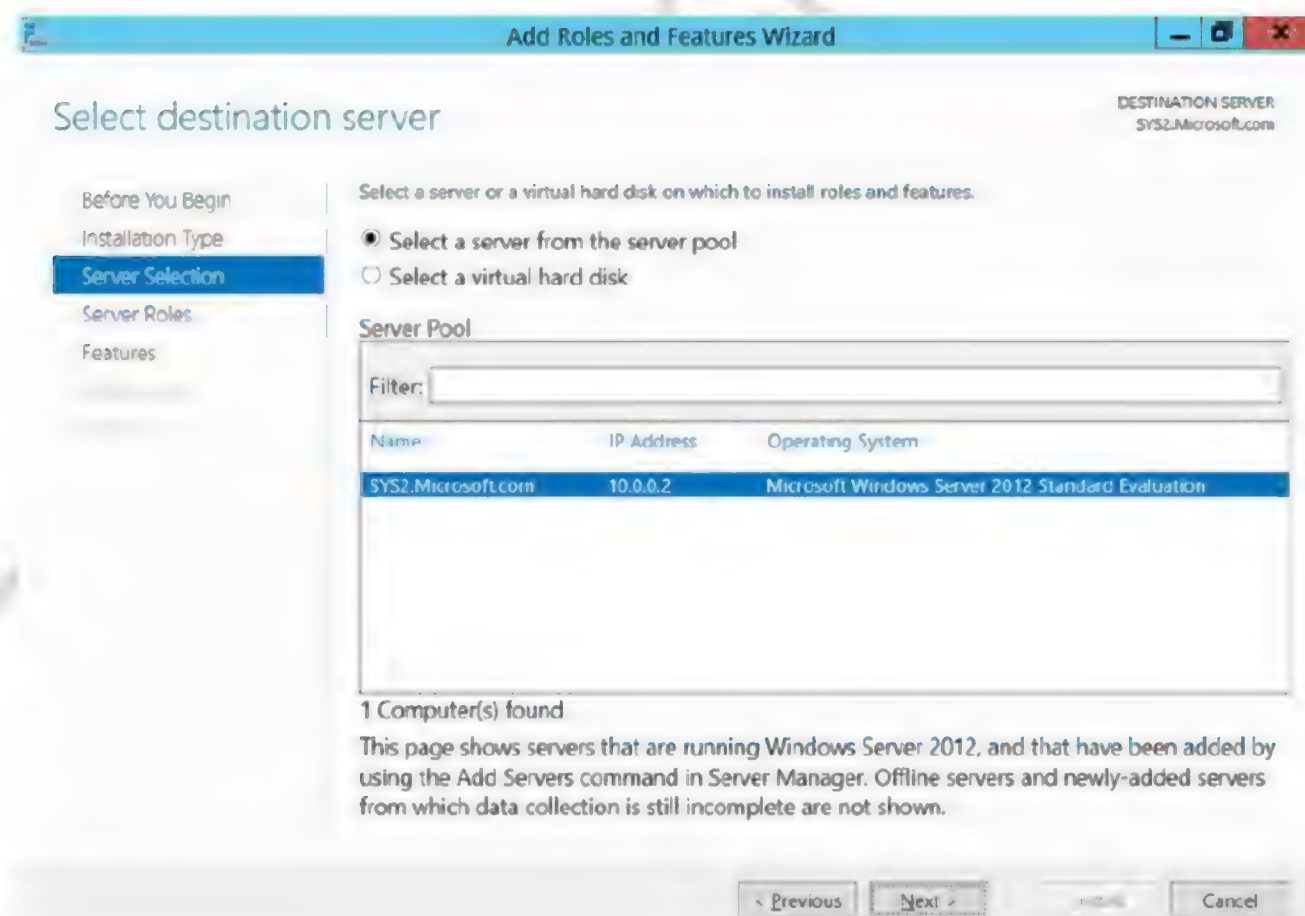
2. In **Before you begin** page, click **Next**



### 3. Installation.

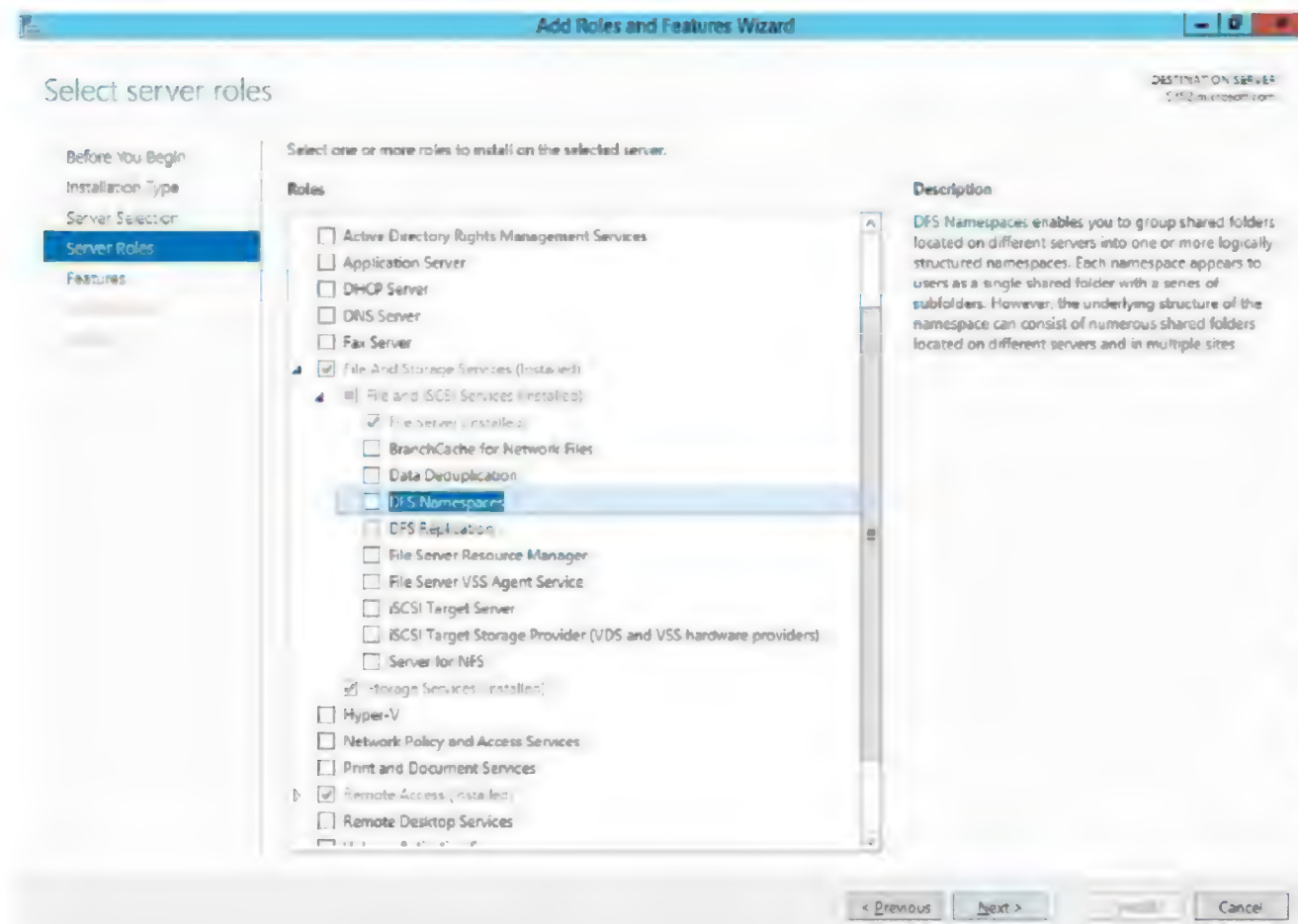


### 4. In Select destination server, from Server Pool select **SYS2.Microsoft.com**, click **Next**.

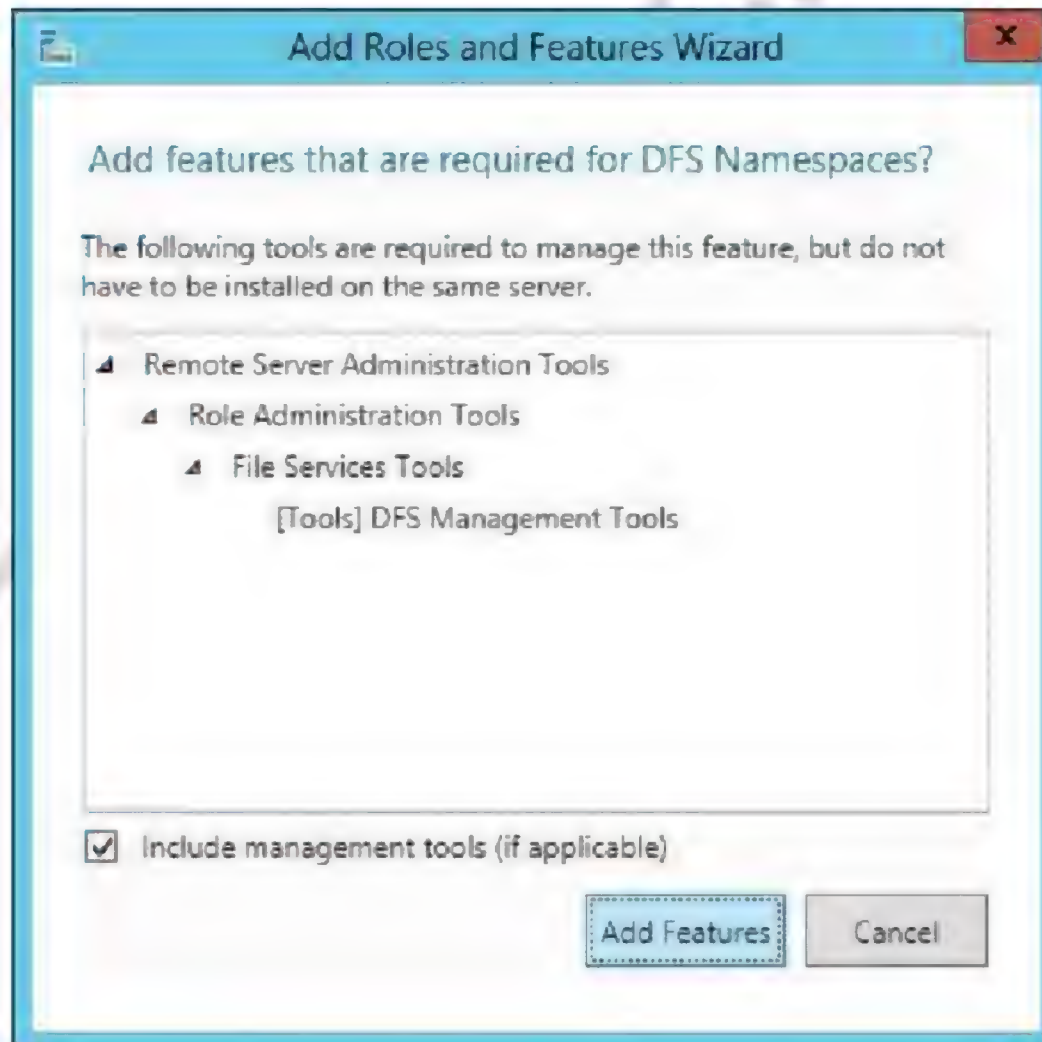




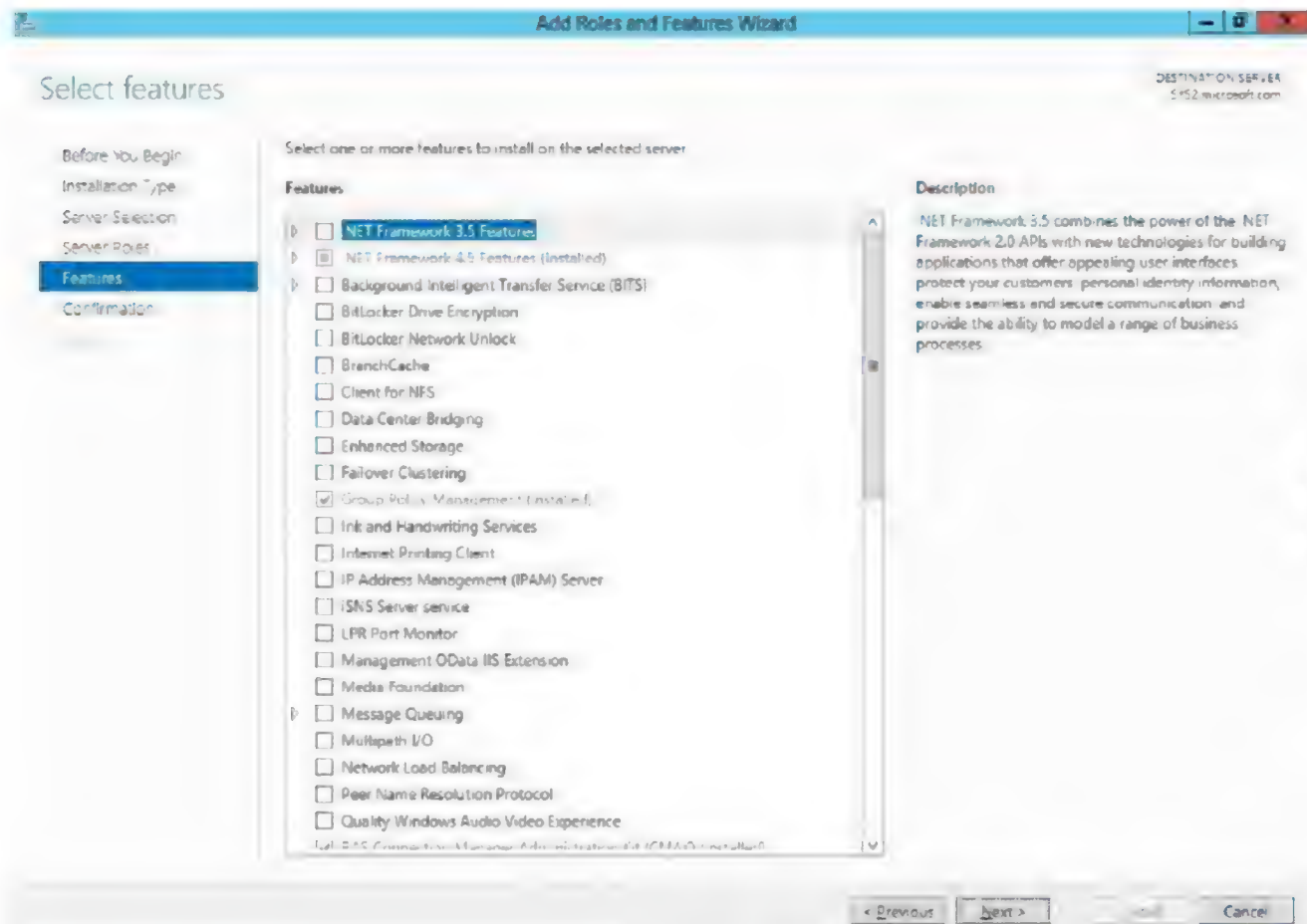
5. Expand File and Storage Services, Expand File and iSCSI Services, check box **DFS Namespaces**.



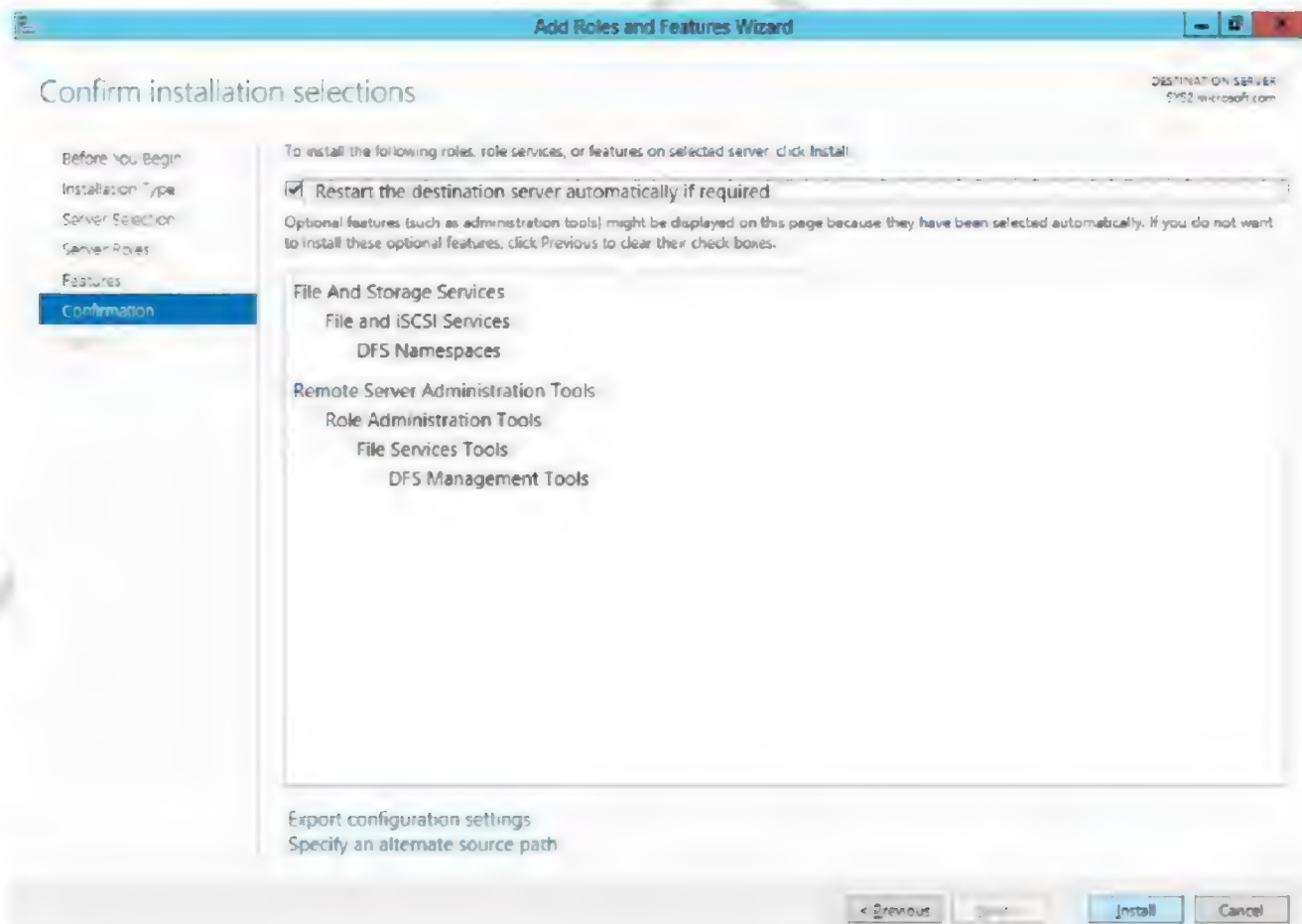
6. Click **Add Features**, to install the required features for DFS Namespaces, Click **Next**.



7. In Select features wizard, click **Next**.



8. Check the box **Restart the destination server automatically if required**. Click **Install**.



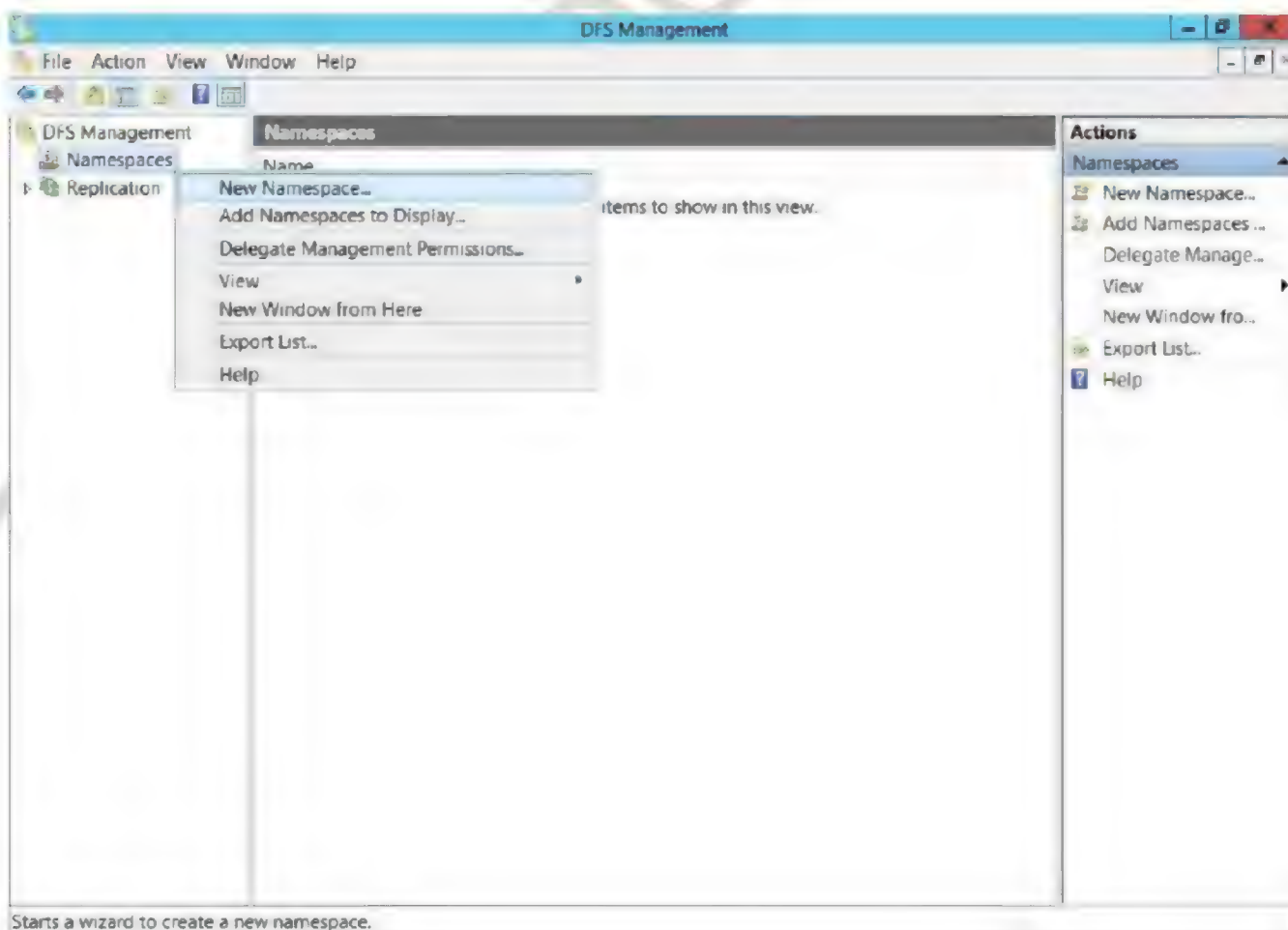
9. Click **Close**.

## Configuring Namespace In DFS

1. In **SYS2** (Member Server) Go to Start, select **DFS Management**.

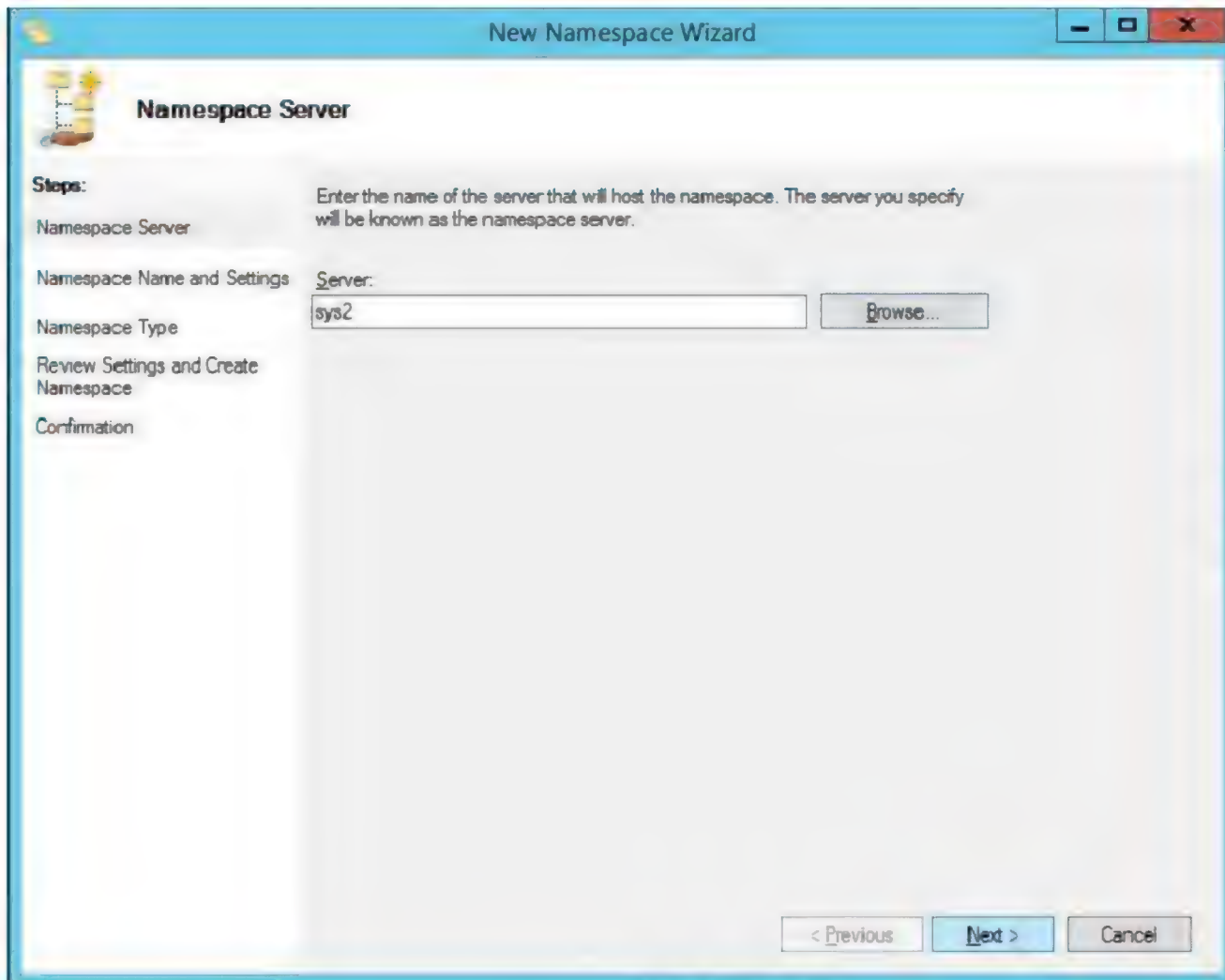


2. Right click Namespaces and Select **New Namespace**



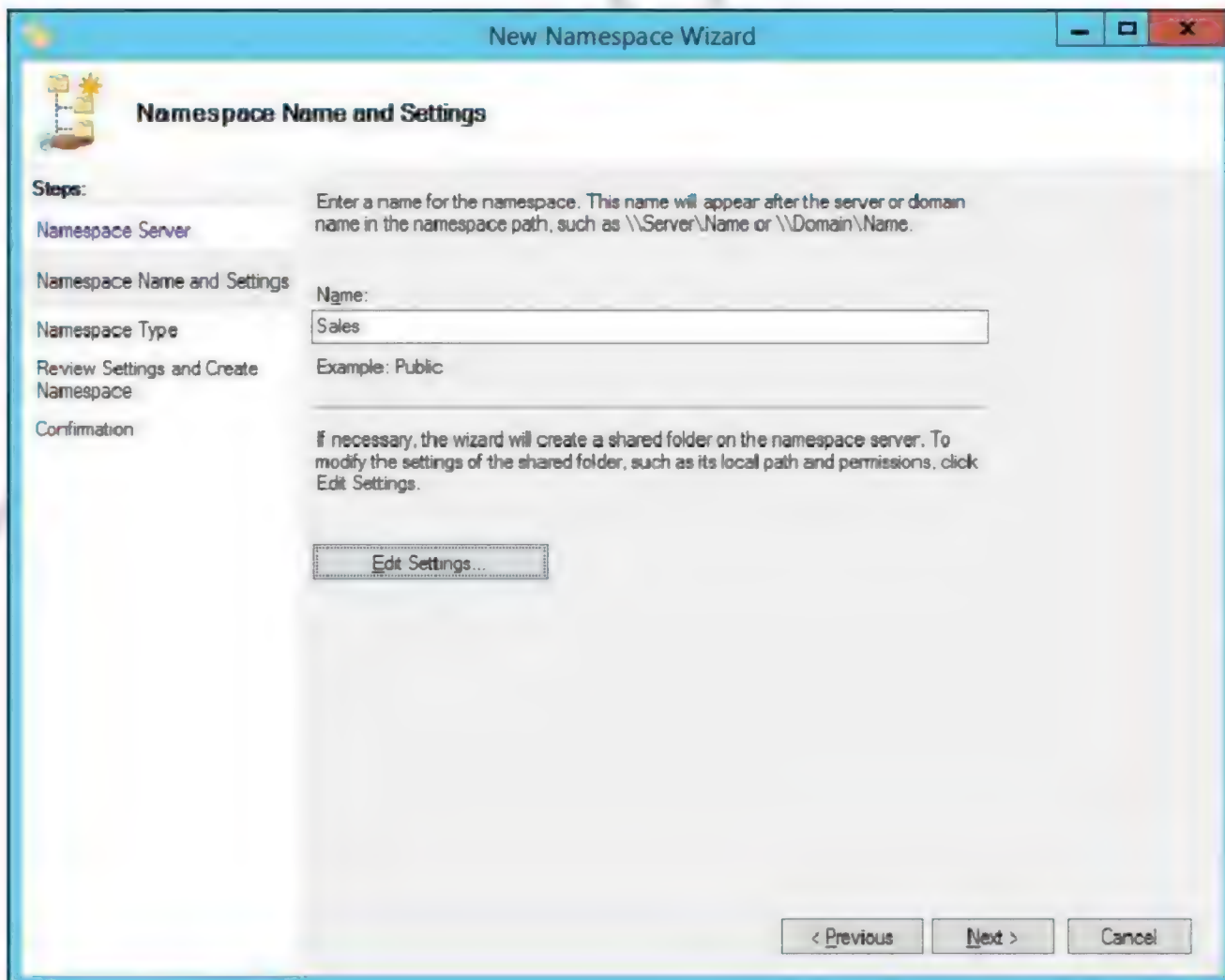


3. Enter the **Server Name** in which **DFS Installed** and Select **Next**.



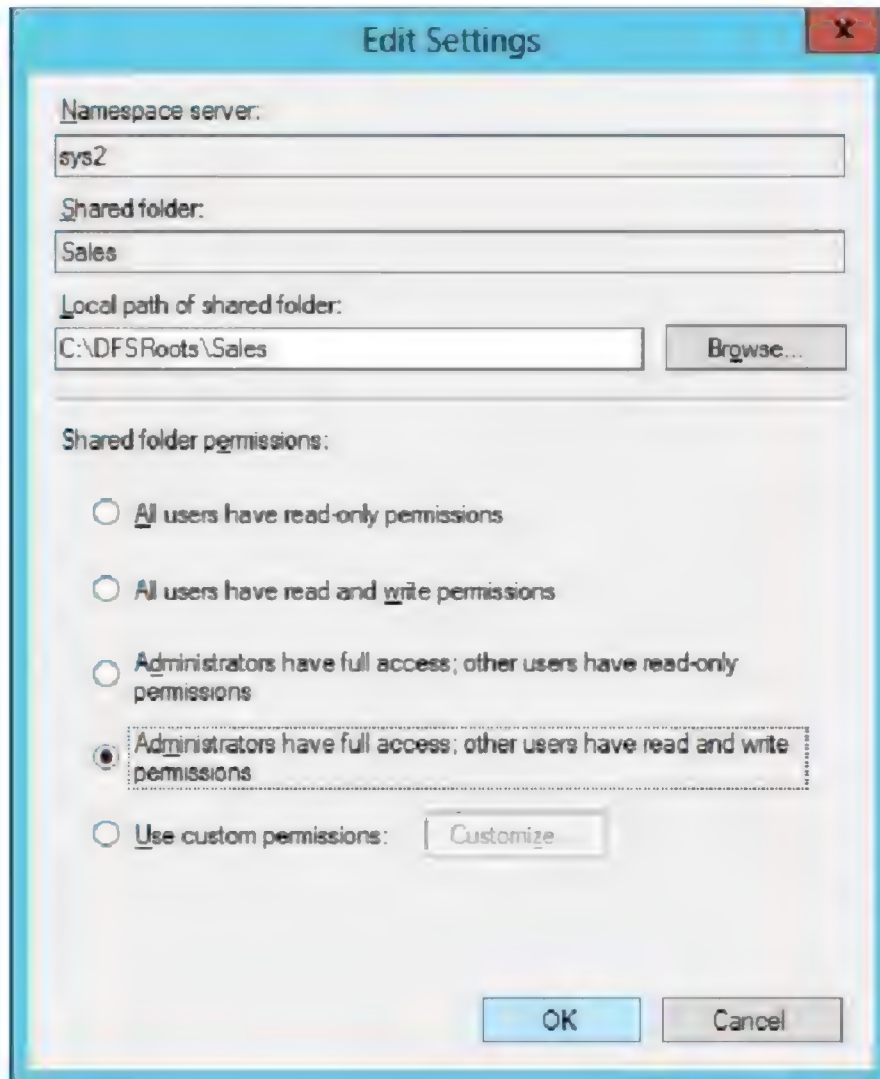
The screenshot shows the 'New Namespace Wizard' window with the title bar 'New Namespace Wizard'. The main window has a title bar 'Namespace Server'. On the left, there is a 'Steps:' list with five items: 'Namespace Server' (selected), 'Namespace Name and Settings', 'Namespace Type', 'Review Settings and Create Namespace', and 'Confirmation'. The main area contains the following text: 'Enter the name of the server that will host the namespace. The server you specify will be known as the namespace server.' Below this, there is a 'Server:' label and a text box containing 'sys2'. To the right of the text box is a 'Browse...' button. At the bottom right, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

4. Enter Name for the **Namespace (Sales)** and click **Edit Settings**.

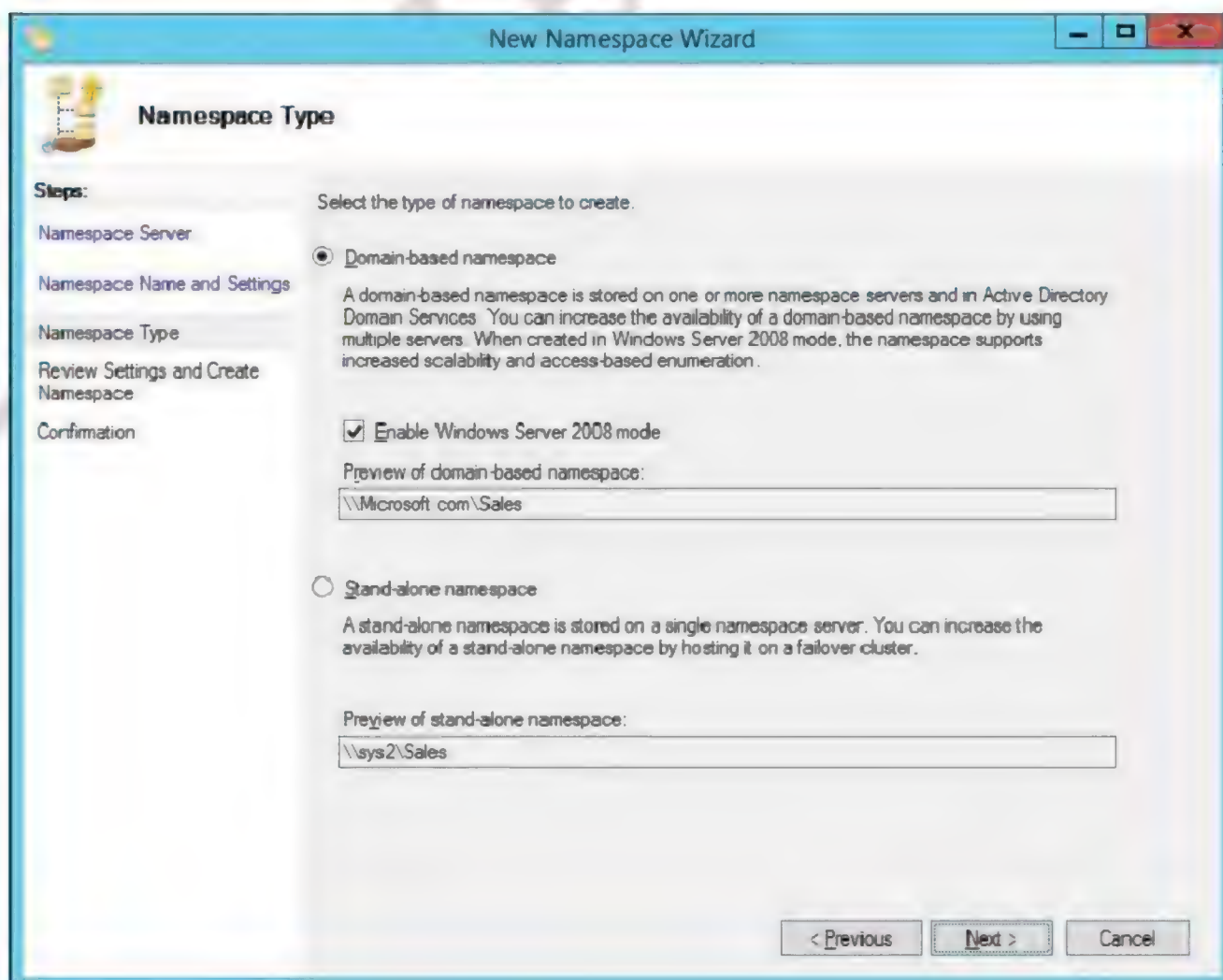


The screenshot shows the 'New Namespace Wizard' window with the title bar 'New Namespace Wizard'. The main window has a title bar 'Namespace Name and Settings'. On the left, there is a 'Steps:' list with five items: 'Namespace Server', 'Namespace Name and Settings' (selected), 'Namespace Type', 'Review Settings and Create Namespace', and 'Confirmation'. The main area contains the following text: 'Enter a name for the namespace. This name will appear after the server or domain name in the namespace path, such as \\Server\\Name or \\Domain\\Name.' Below this, there is a 'Name:' label and a text box containing 'Sales'. To the right of the text box is a 'Browse...' button. Below the text box, there is an 'Example: Public' label and a text box containing 'Public'. At the bottom, there is a paragraph: 'If necessary, the wizard will create a shared folder on the namespace server. To modify the settings of the shared folder, such as its local path and permissions, click Edit Settings.' Below this paragraph is an 'Edit Settings...' button. At the bottom right, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

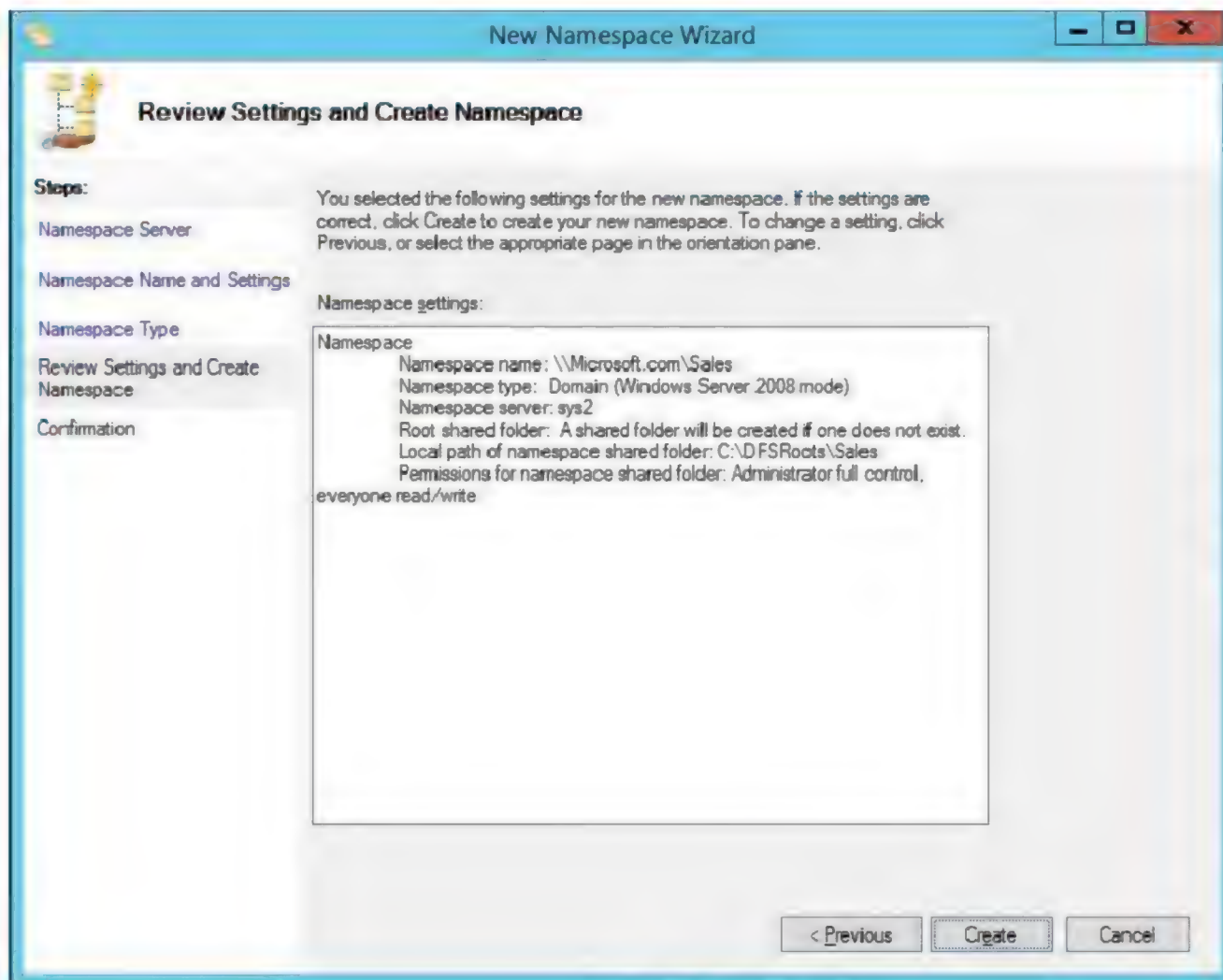
- Select the Permissions **Administrators have full access, other users have read and write permissions**, and click **Next**.



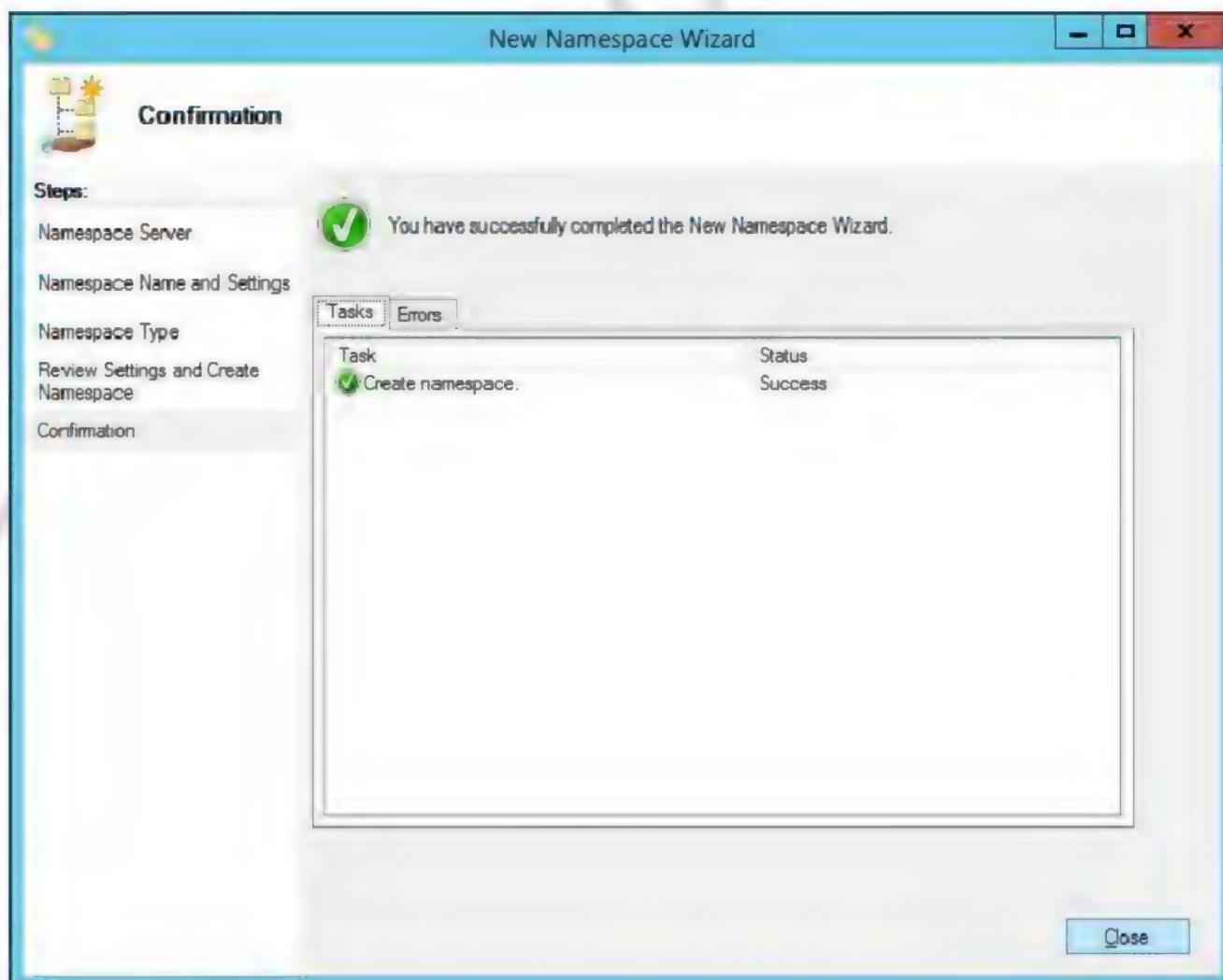
- Select **Domain Based Namespace** → click **Next**



7. Click **Create**



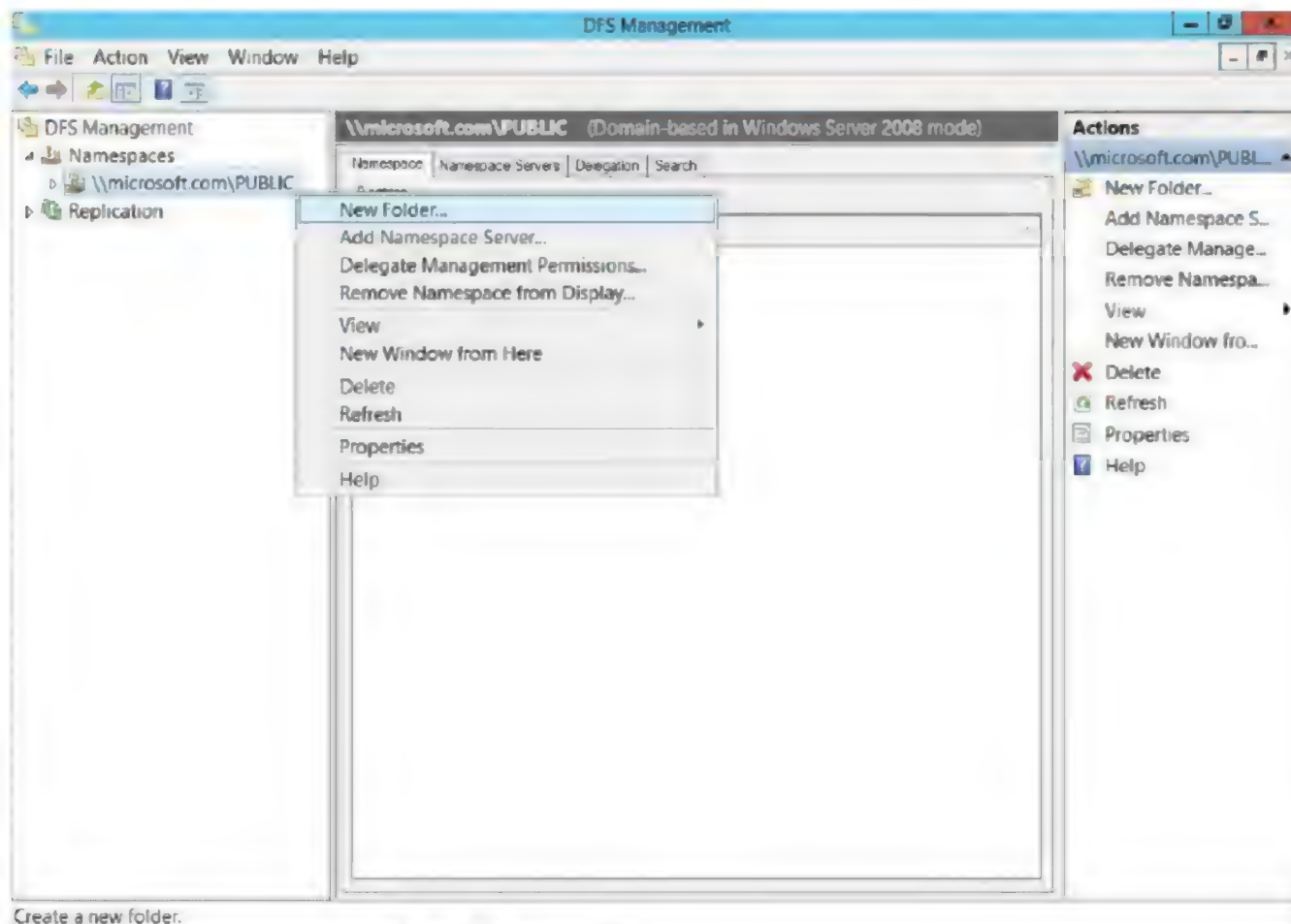
8. Select **Close**



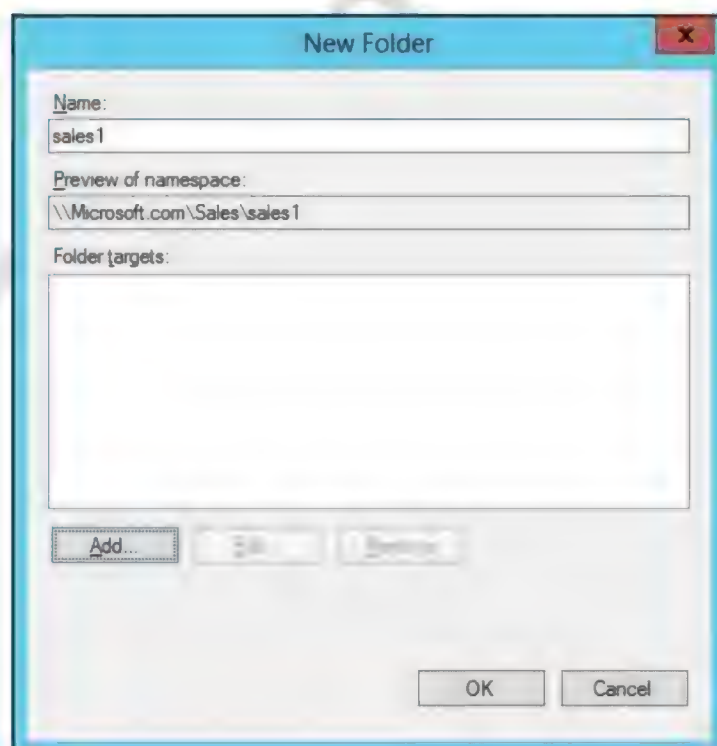


## Configuring New Folder In Namespace

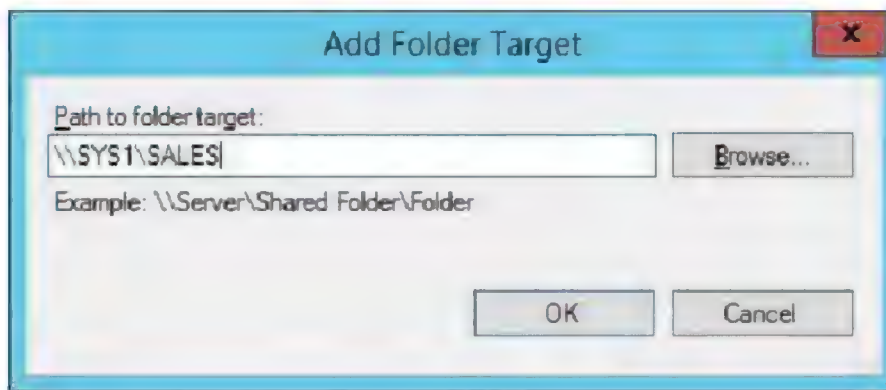
1. In **SYS1 (DC)** open any **Drive** which is formatted with **NTFS**
2. Create a shared folder (**Sales1**) and give permission (Ex:Read\Write for Everyone)
3. Similarly create a shared folder (**Sales2**) on **SYS2** and assign permission.
4. In **SYS2 (Member Server)** go to **DFS Management** and Expand Namespaces
5. Right click on namespace name and Select **New Folder**



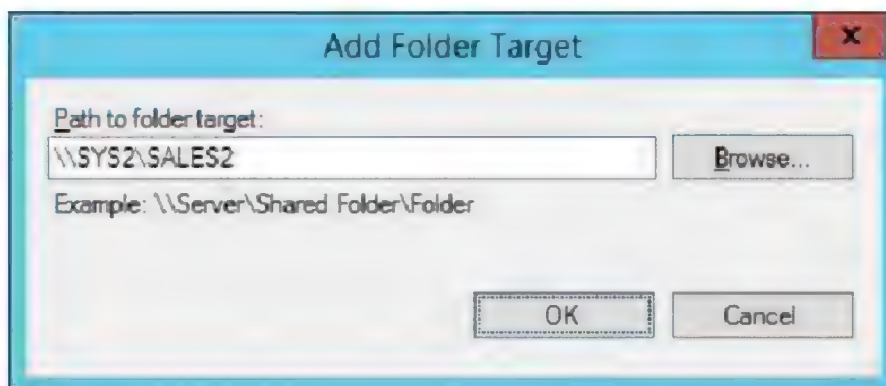
6. Enter the Name (Ex: **Sales1**) and click Add.



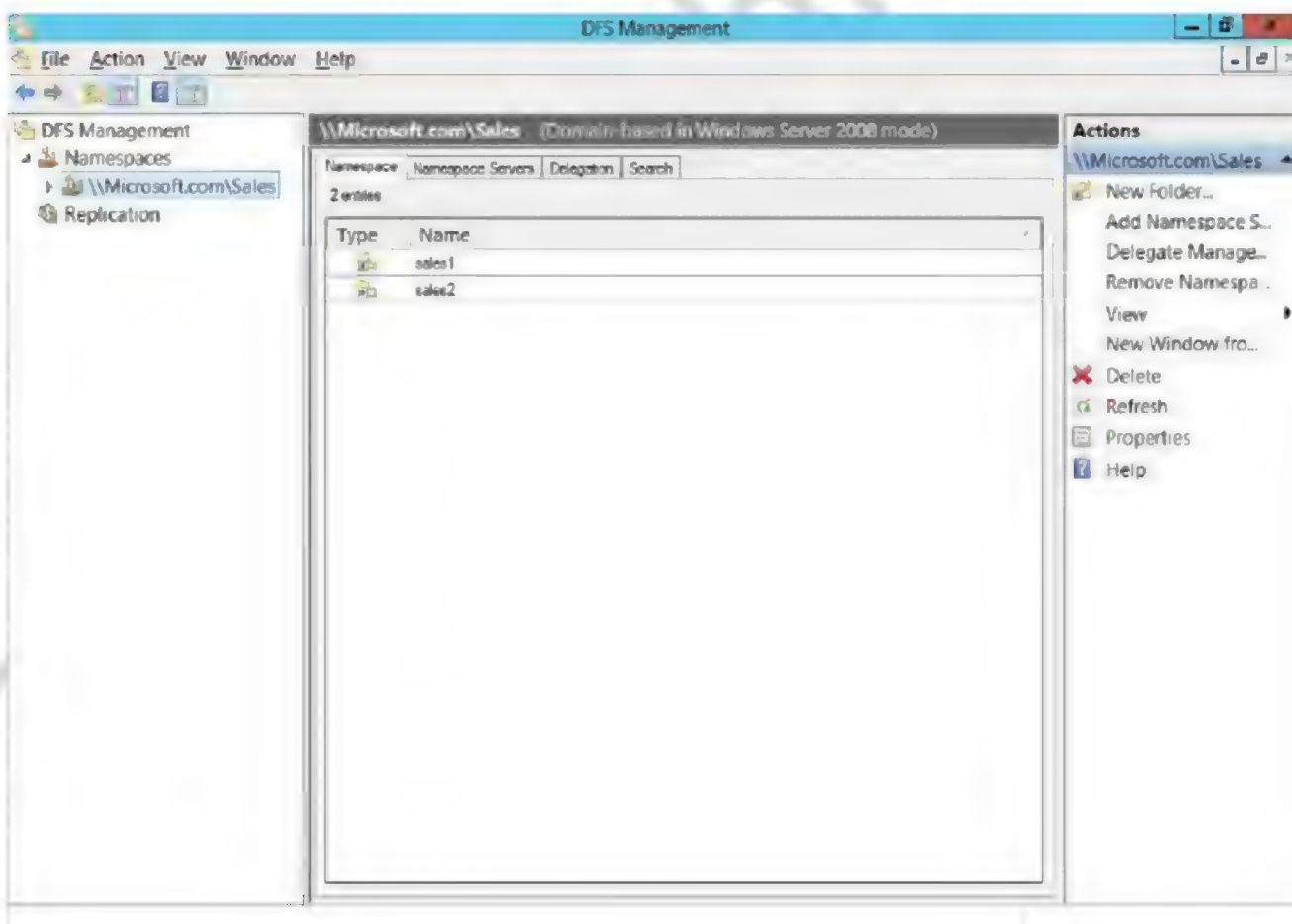
7. Enter the path for folder target ([\\Systemname\Sharefoldername](#))&click **OK**.



8. Similarly add another DFS Folder (Ex: **Sales2**) and folder target [\\SYS2\Sales2](#).

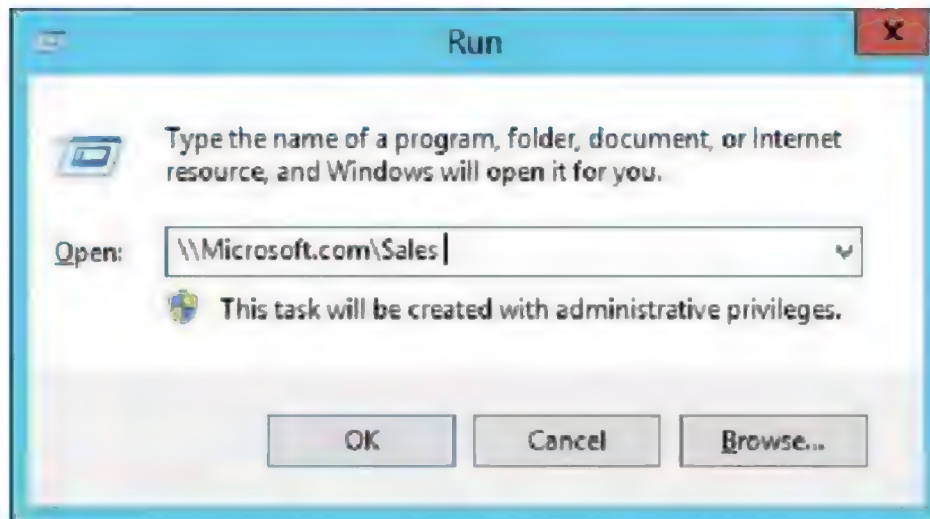


9. Go to DFS Management, Expand Namespaces, and select [\\Microsoft.com\Sales](#).

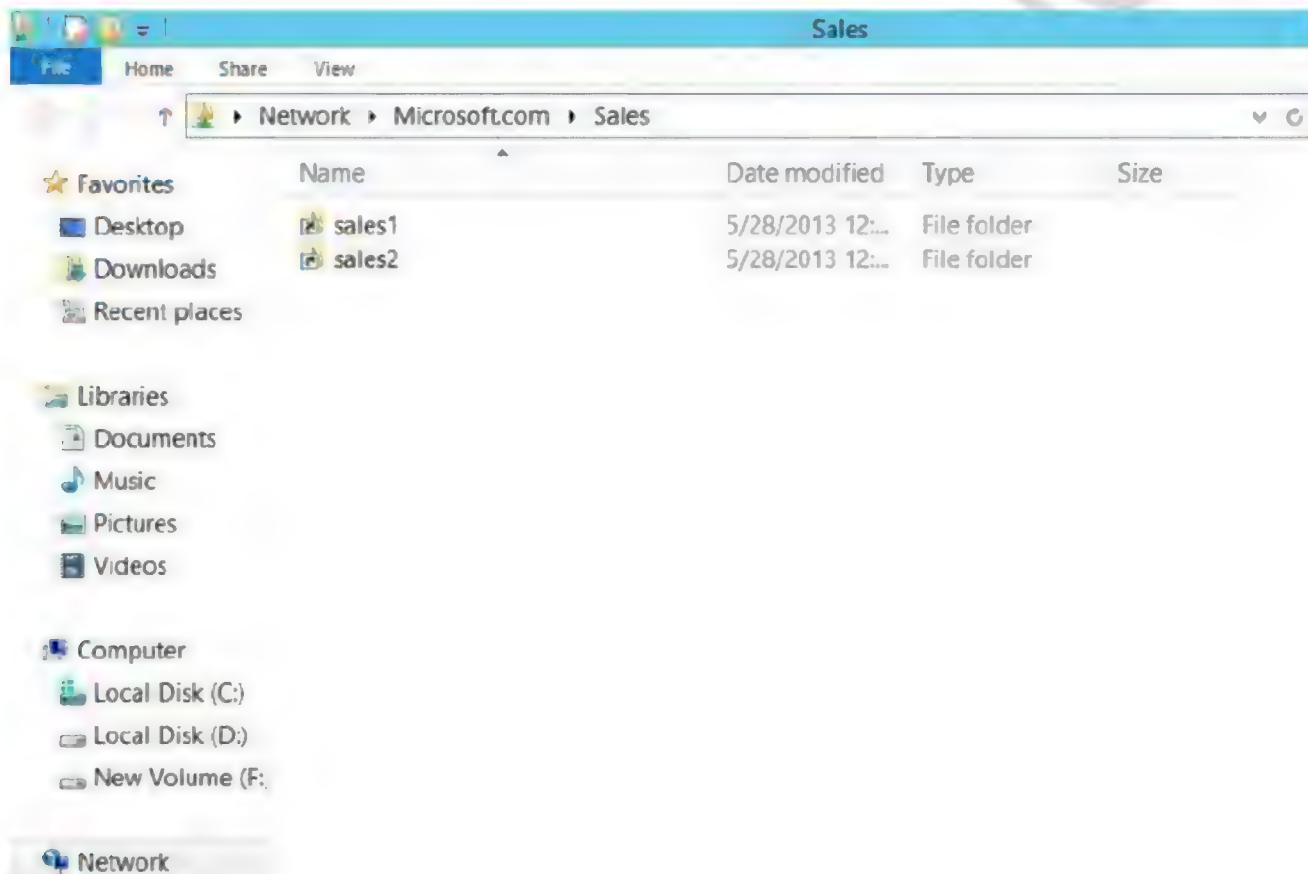


**VERIFICATION:**

1. In **SYS2** (Member Server), Go to Start, type Run in Search Apps, and select Run, type \\Domain name\Namespace Name (Ex: \\Microsoft.com\Sales)



2. It will display the contents (Folder) of Namespace.





## Lab – 26: Installing Additional Domain Controller

### Objective:

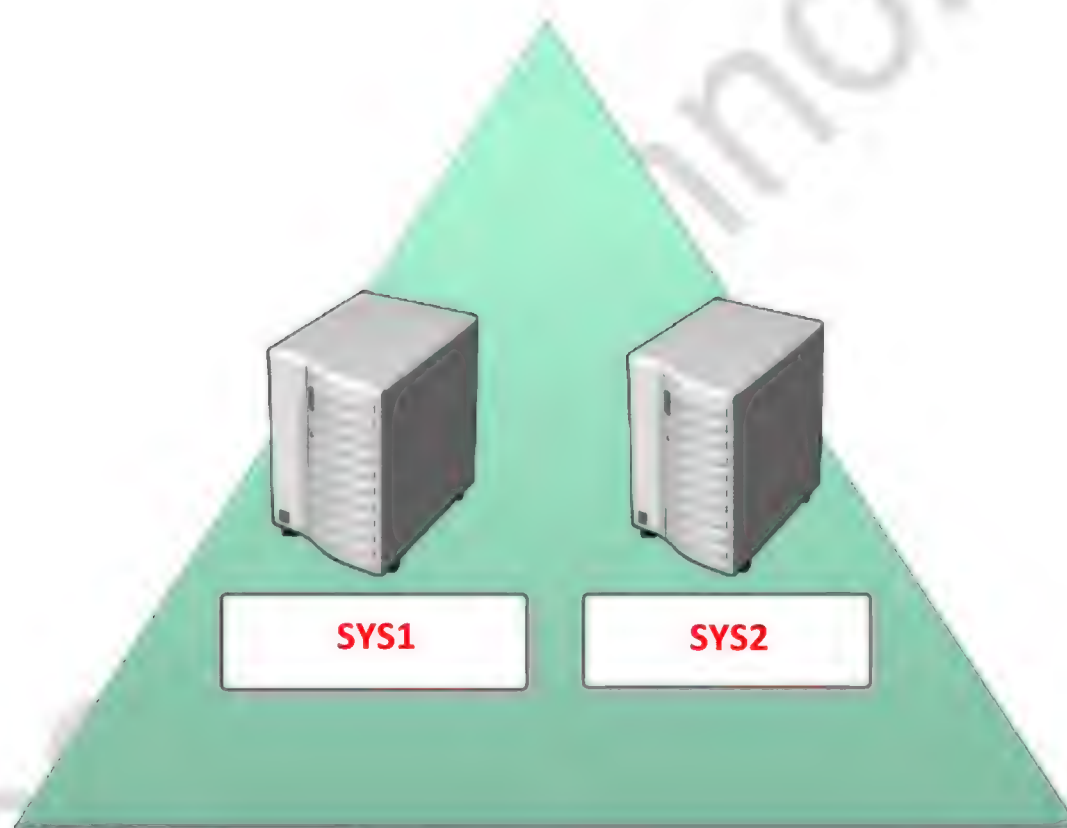
To install one more Domain Controller (backup) in the existing domain

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	-----

#### SYS2

##### Workgroup

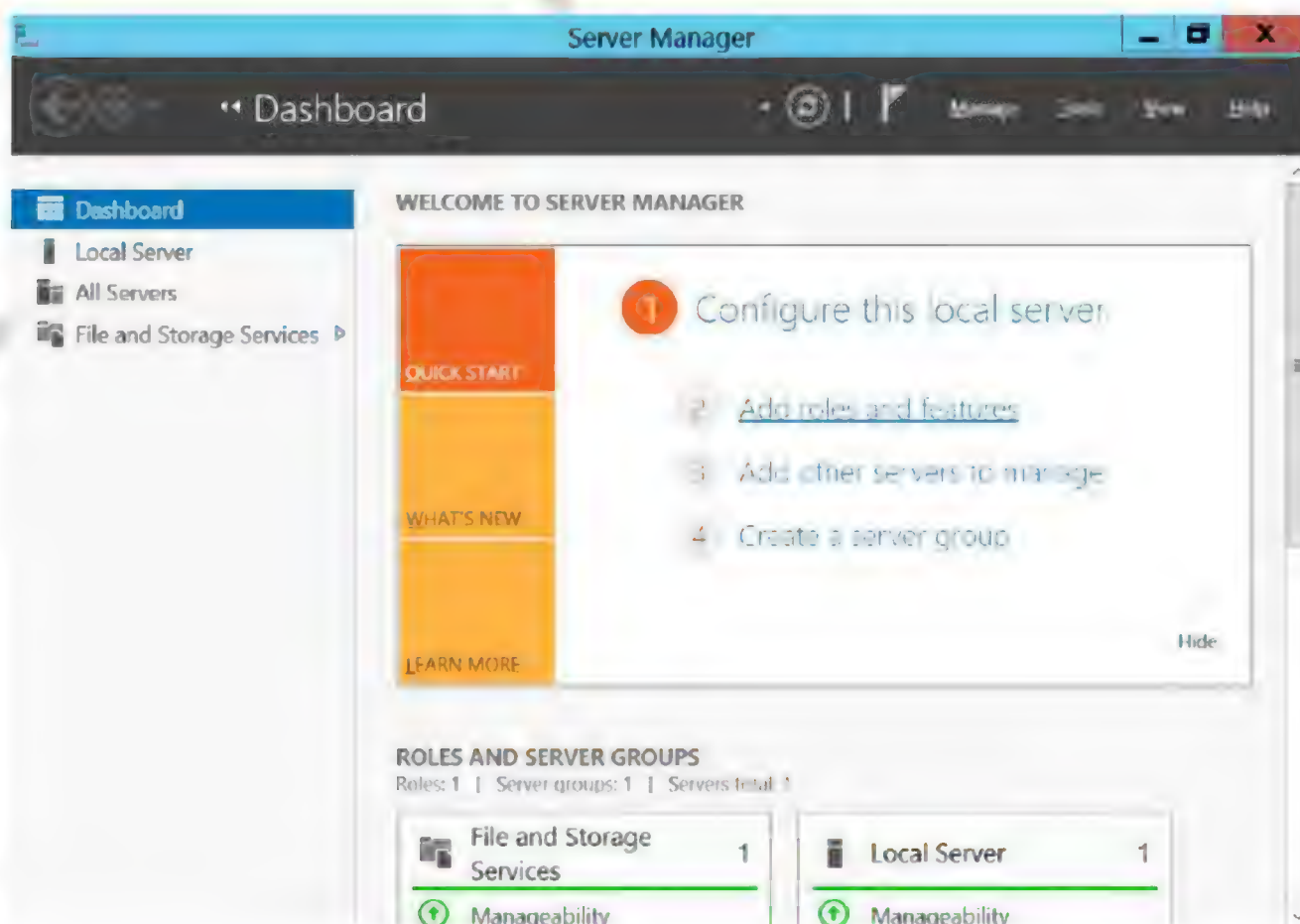
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2
Alternate DNS	10.0.0.1

**Steps:**

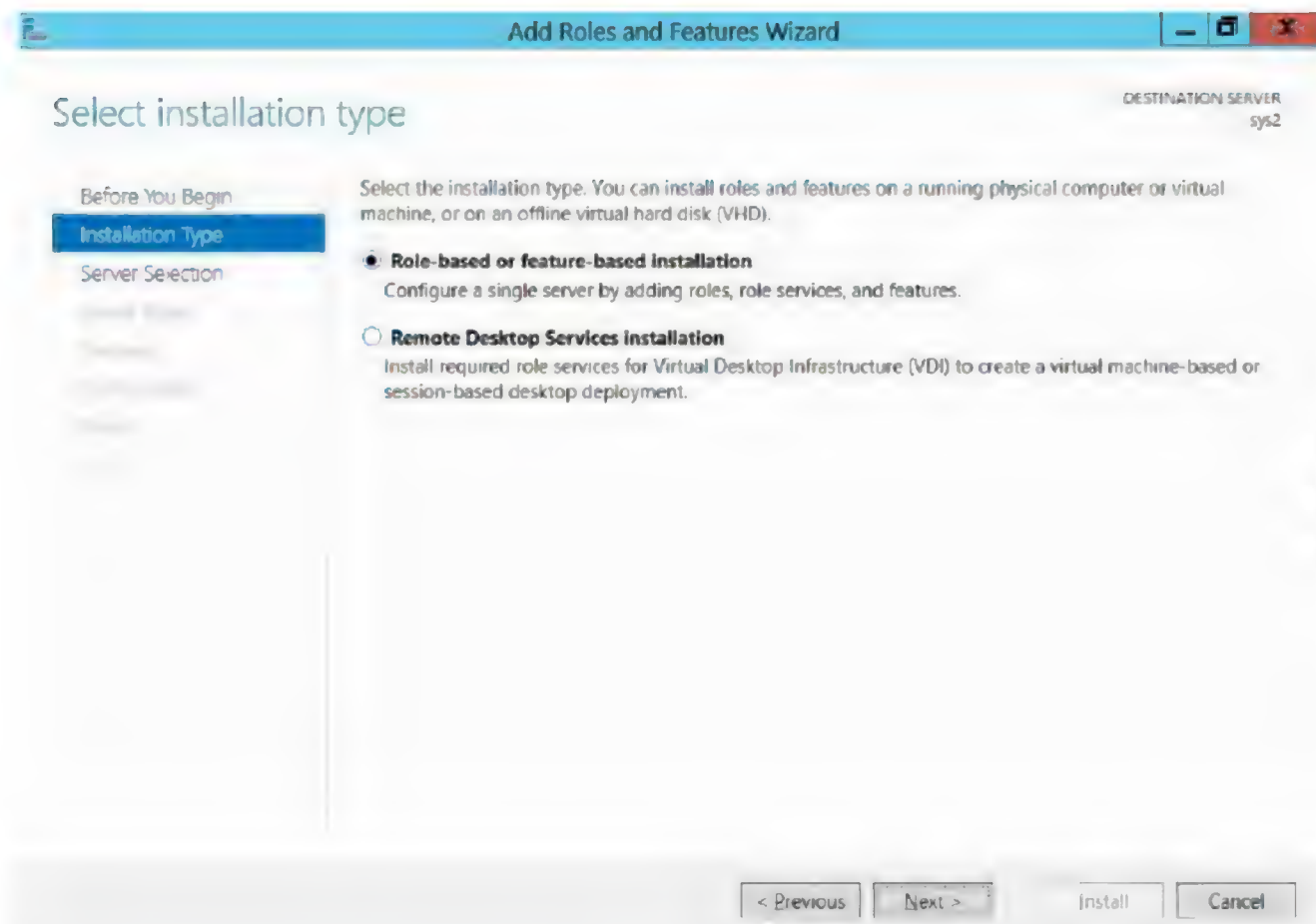
1. Log in as Administrator to the **Workgroup Computer**.
2. Assign **IP Address** and preferred **DNS Server Address**
3. Click Server Manager



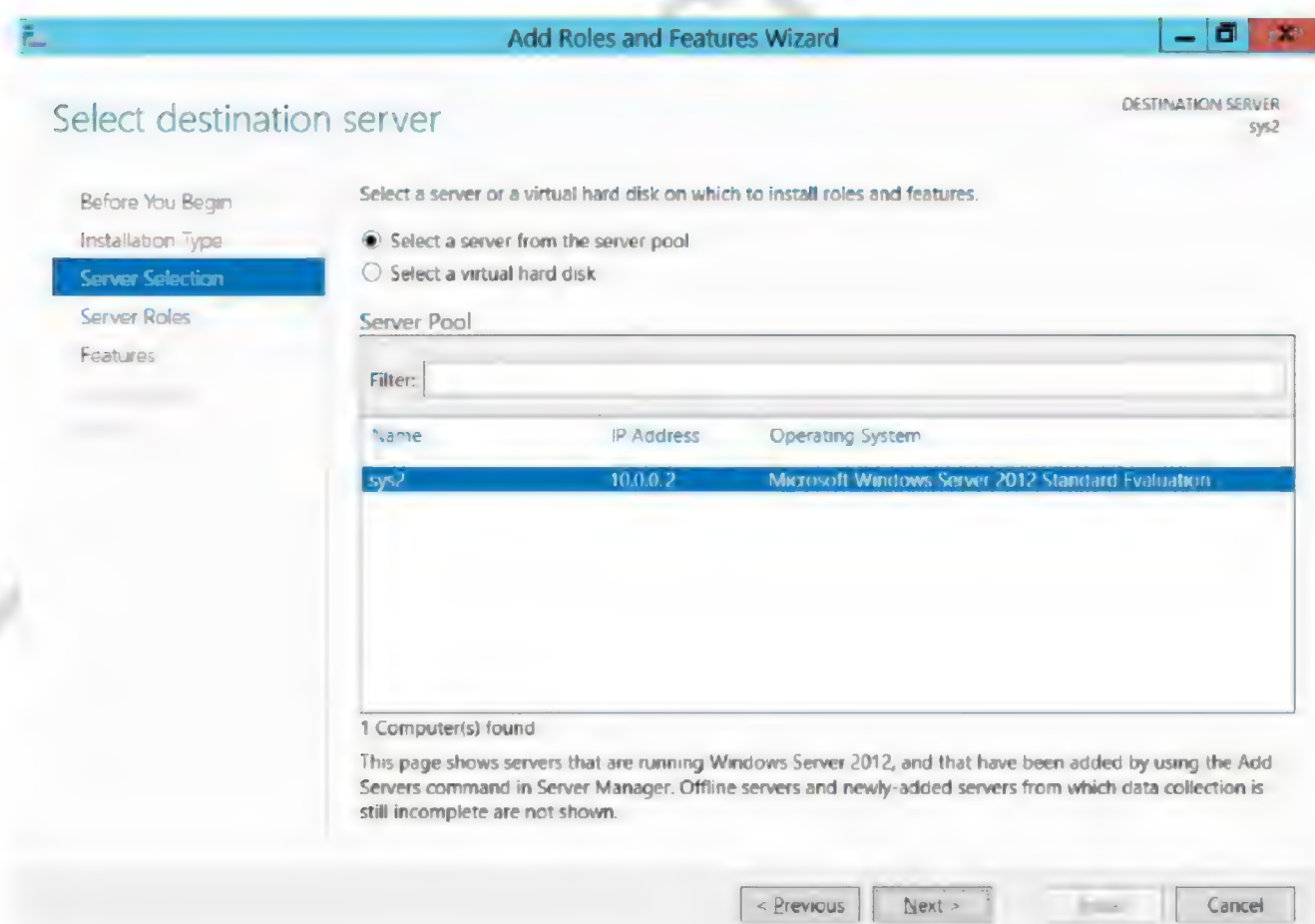
4. In Server Manager Dashboard, Click **Add roles and features**.



5. In Before you begin page, click **Next**, In Select installation type, select **Role-based or feature-based installation**, click **Next**.

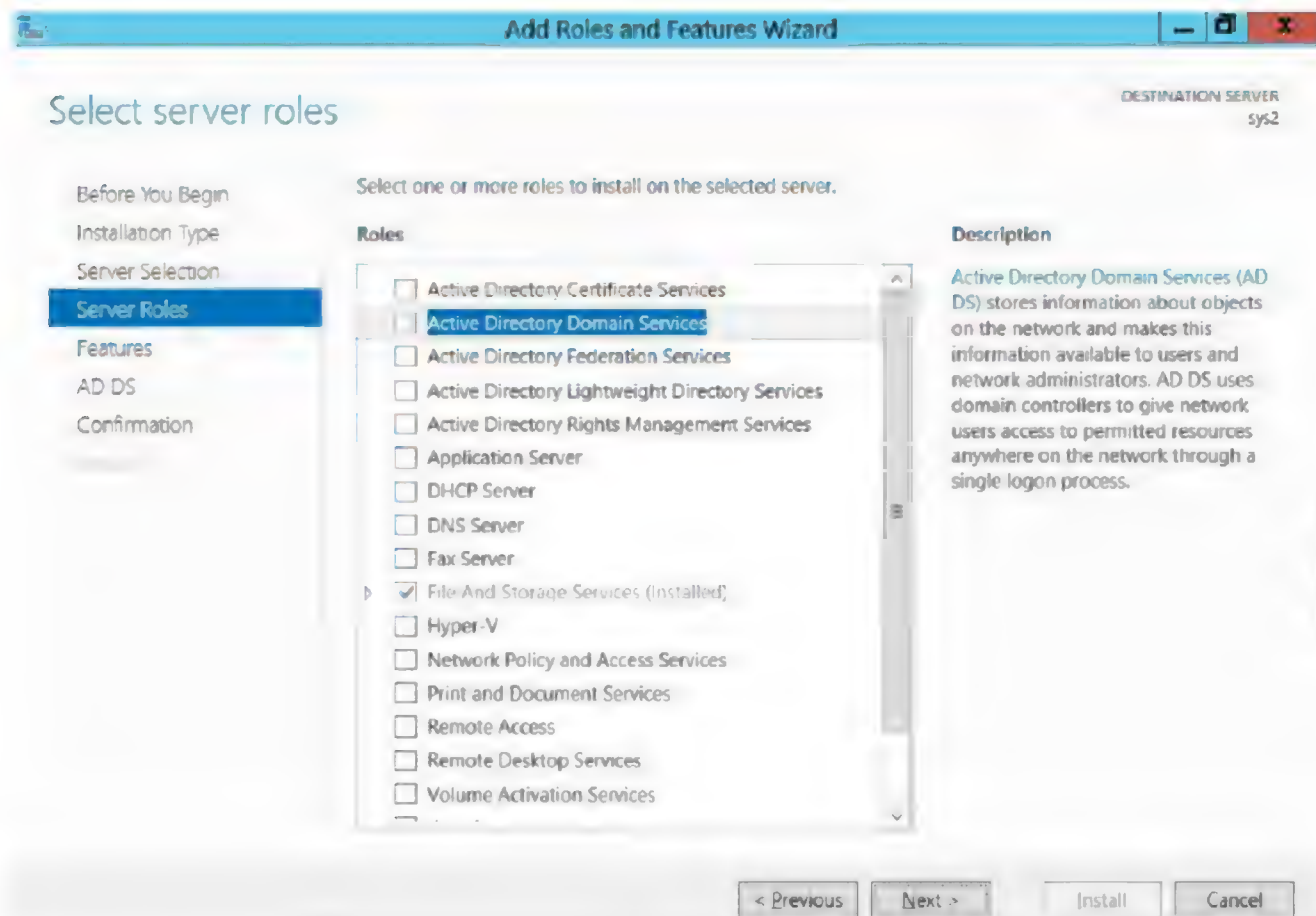


6. In Select destination server, from Server Pool select **SYS2**, click **Next**.

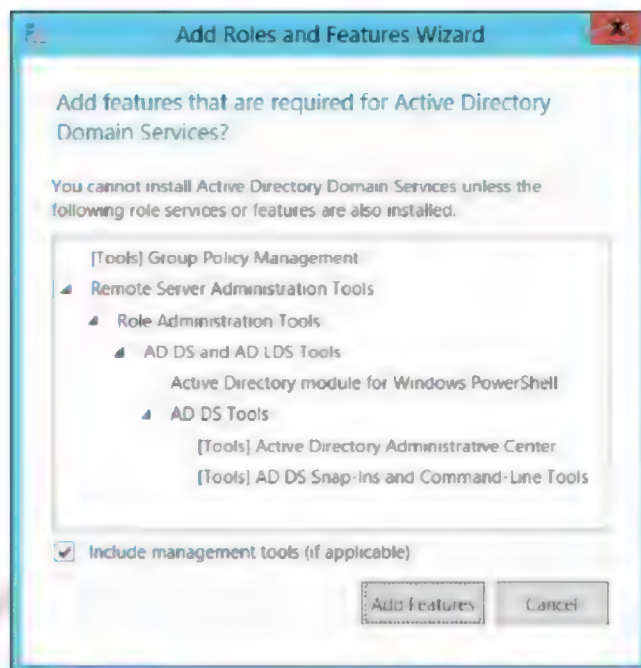




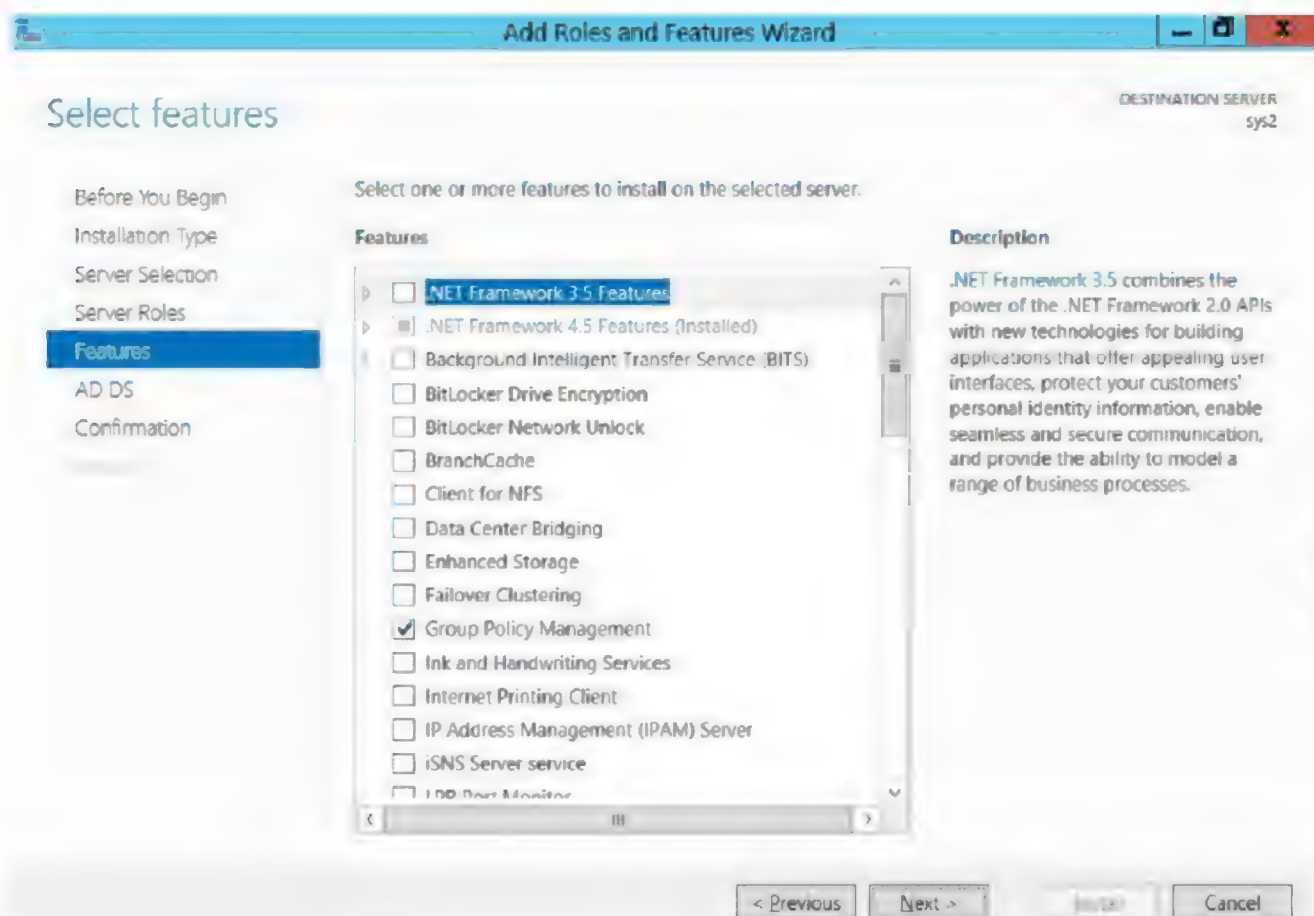
7. In Roles, check the box **Active Directory Domain Services**.



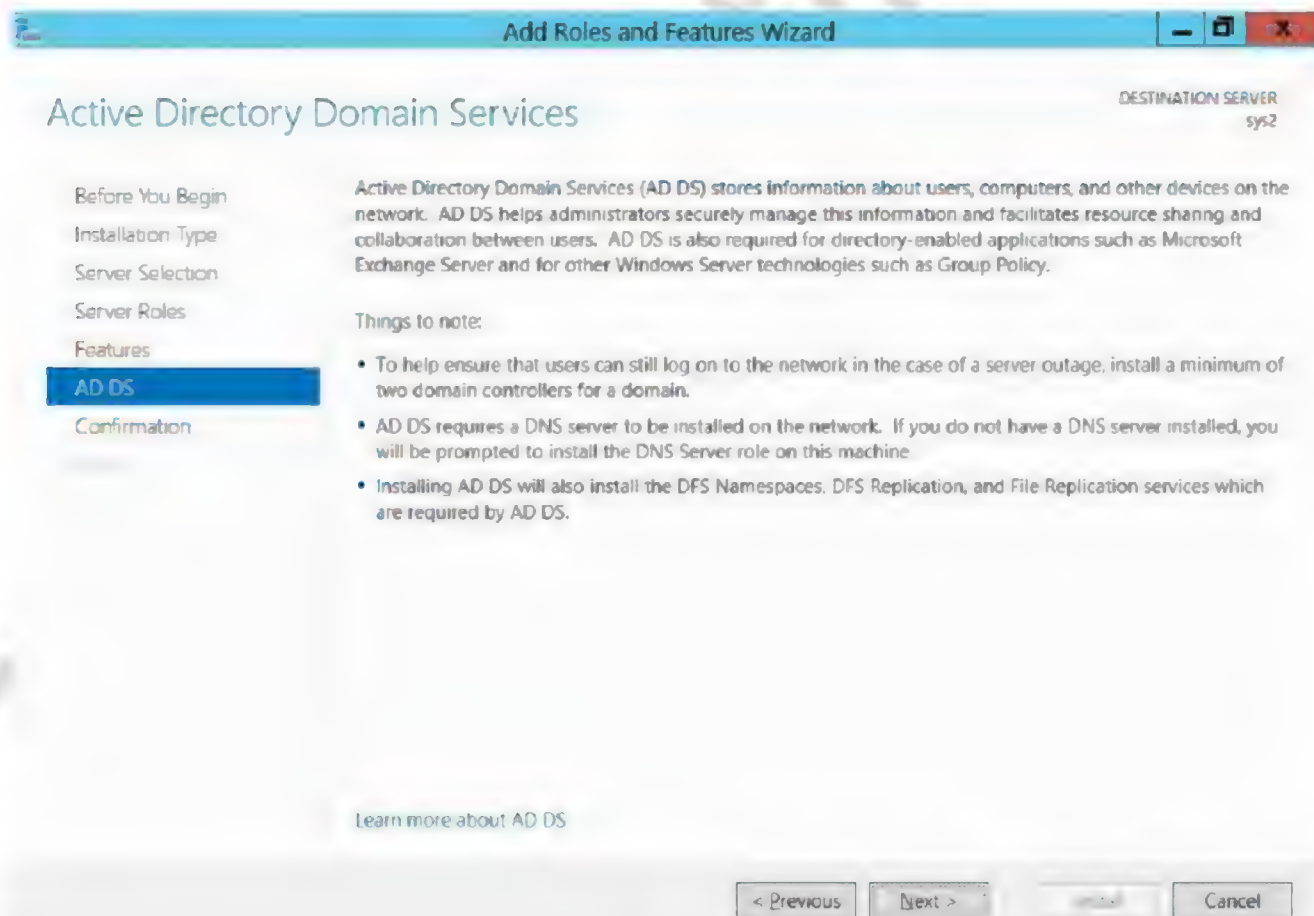
8. Click **Add Features**, to install the required features for Active Directory Domain Services. Click **Next**.



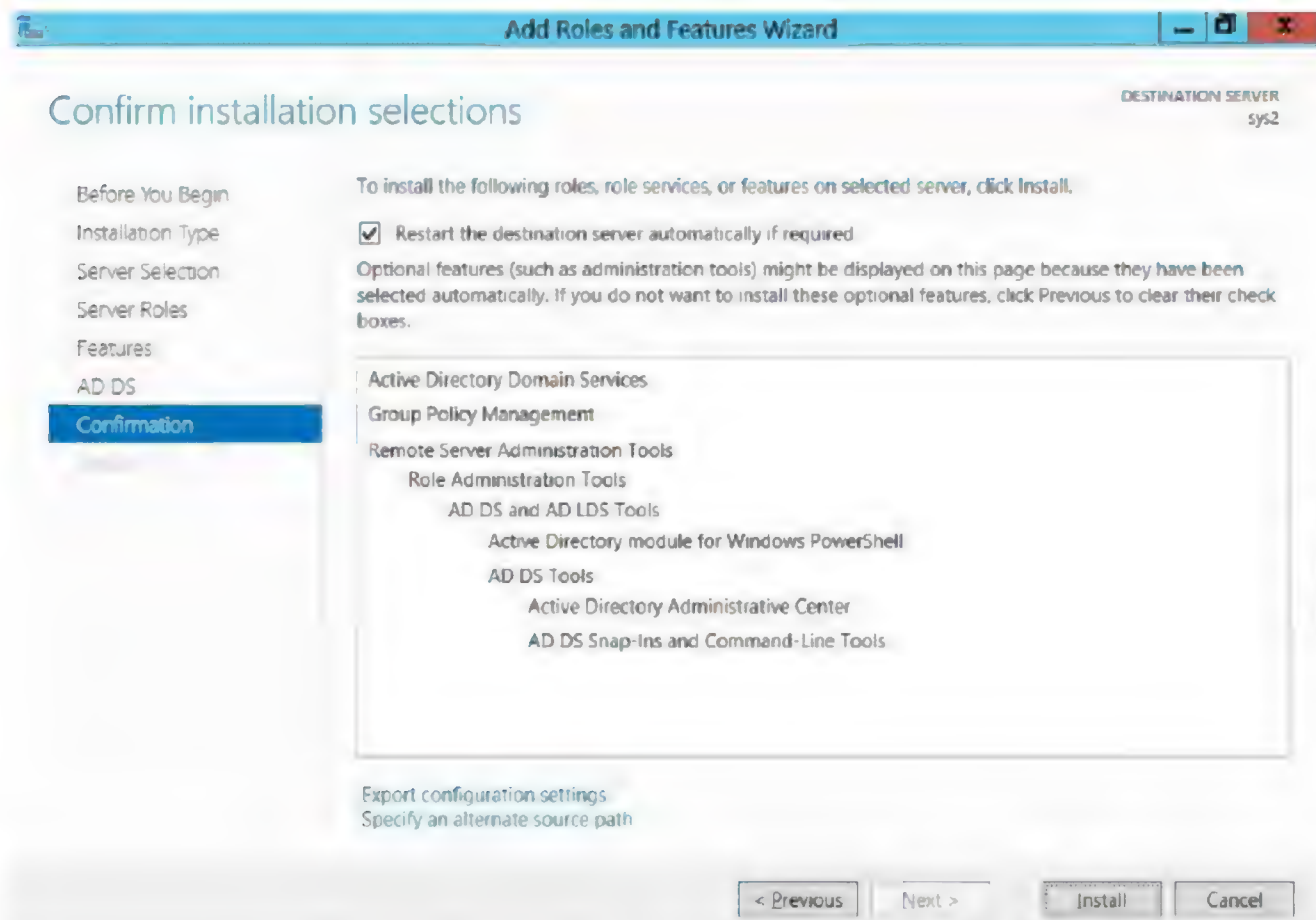
9. In Select features wizard, click **Next**.



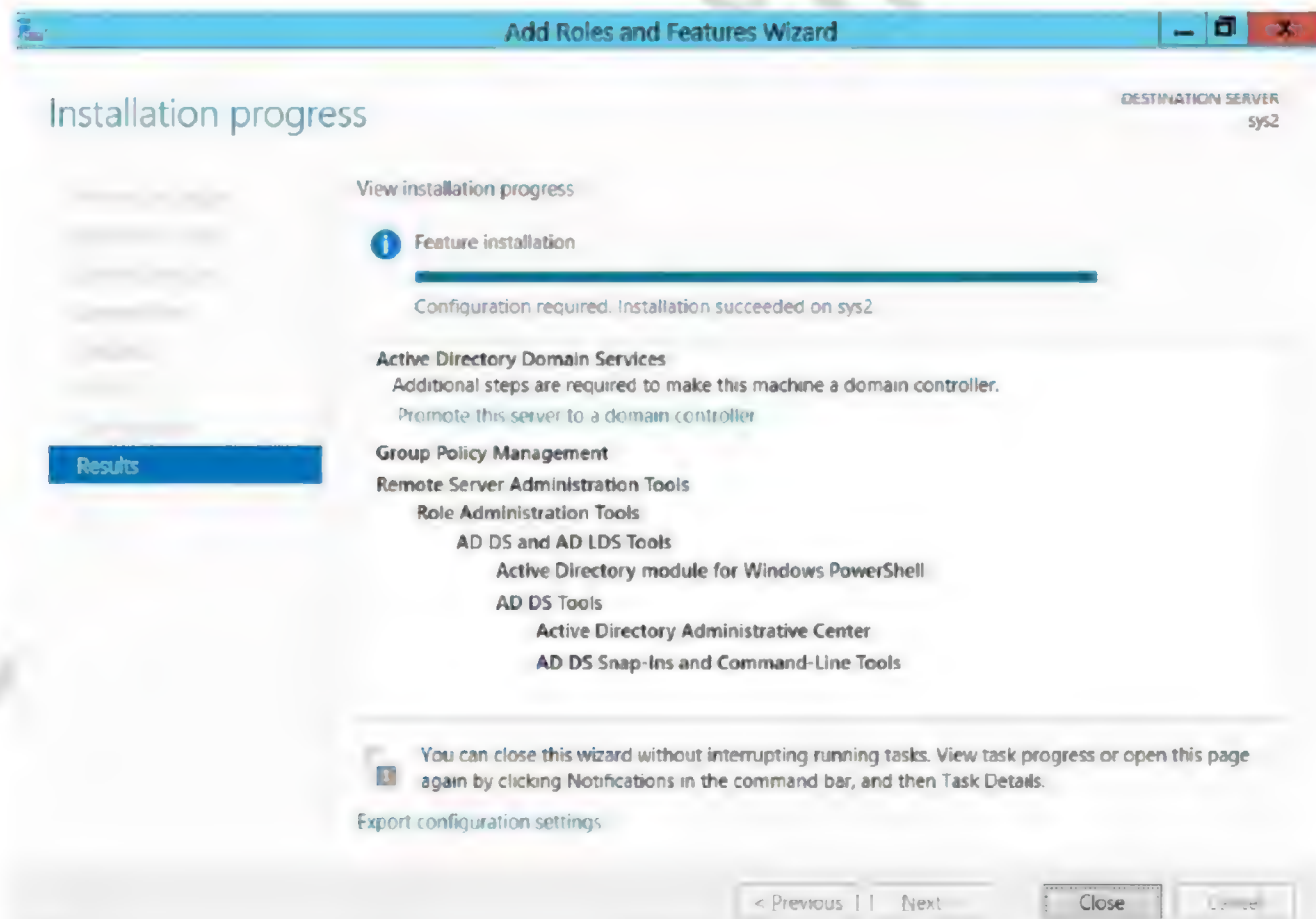
10. In Active Directory Domain Services wizard, click **Next**.



11. Check the box **Restart the destination server automatically if required**. Click **Install**.

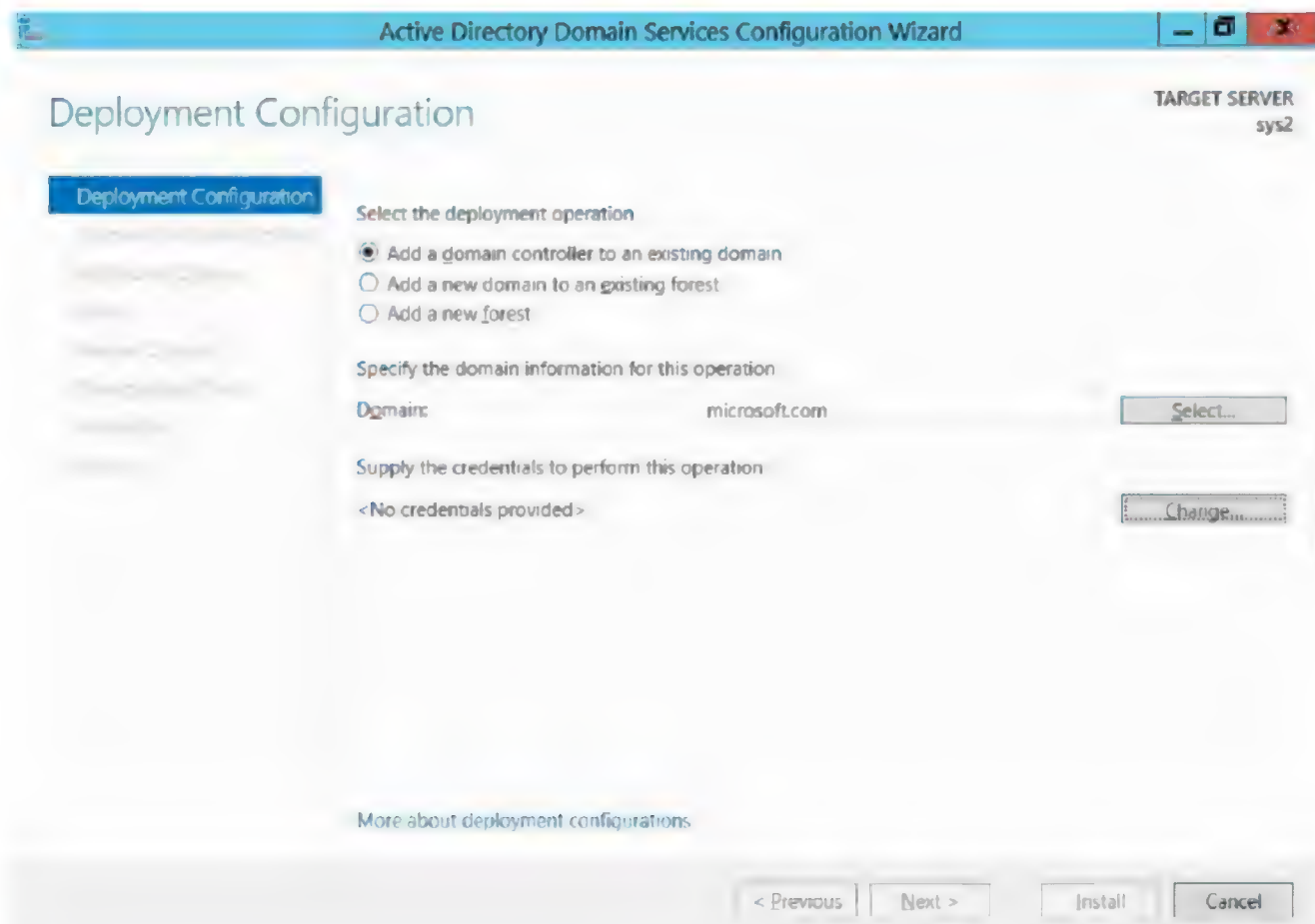


12. Click **Promote this server to a domain controller**.

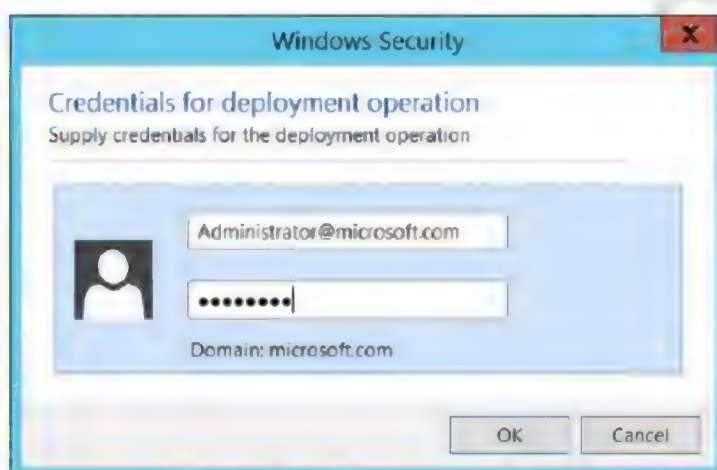




13. In Deployment Configuration wizard, select **Add a domain controller to an existing domain**, enter the Domain (Ex: **Microsoft.com**) and click **Change**.



14. Enter User Name: **Administrator@microsoft.com** and Password, click **OK**.



15. Click **Next**.

16. In Domain Controller Options, review the default settings, and type the Directory Services Restore Mode **Password** and **Confirm password** and click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main heading is 'Domain Controller Options'. In the top right corner, it says 'TARGET SERVER sys2'. On the left, there is a navigation pane with the following items: 'Deployment Configuration', 'Domain Controller Options' (which is highlighted), 'DNS Options', 'Additional Options', 'Paths', 'Review Options', and 'Prerequisites Check'. The main area is titled 'Specify domain controller capabilities and site information'. It contains the following options:
 

- ☒ Domain Name System (DNS) server
- ☒ Global Catalog (GC)
- ☐ Read only domain controller (RODC)
- Site name: Default-First-Site-Name (dropdown menu)
- Type the Directory Services Restore Mode (DSRM) password:
  - Password: [masked with dots]
  - Confirm password: [masked with dots]

 At the bottom, there is a link 'More about domain controller options'. The bottom of the window has buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

17. On DNS Options page, click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main heading is 'DNS Options'. In the top right corner, it says 'TARGET SERVER sys2'. At the top, there is a yellow warning box that says: 'A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does not show more'. Below this, on the left, the navigation pane has the following items: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options' (which is highlighted), 'Additional Options', 'Paths', 'Review Options', and 'Prerequisites Check'. The main area is titled 'Specify DNS delegation options'. It contains the following option:
 

- ☐ Update DNS delegation

 At the bottom, there is a link 'More about DNS delegation'. The bottom of the window has buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

18. In Additional Options Page, select Replicate from **Sys1.Microsoft.com**, click **Next**.

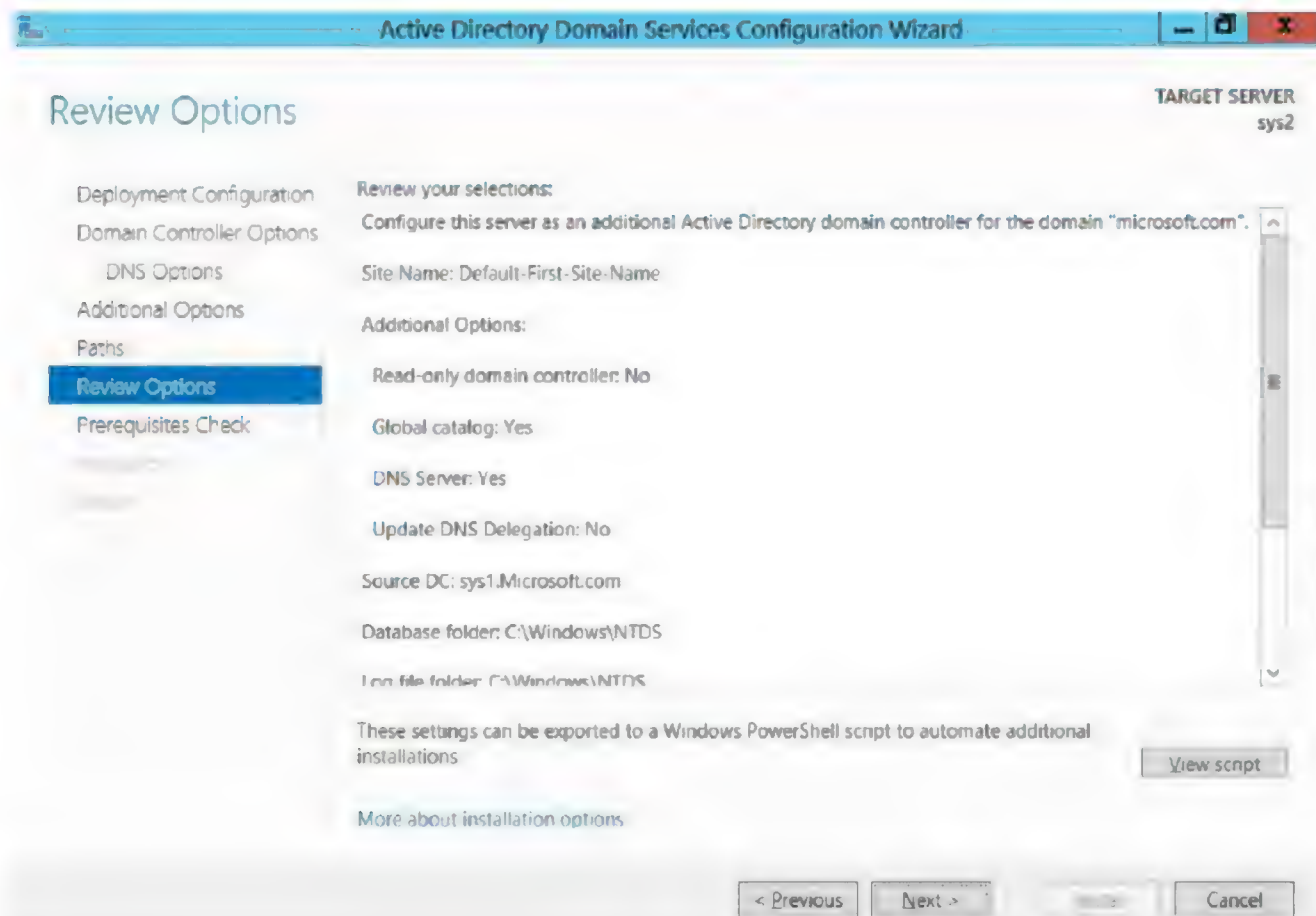
The screenshot shows the 'Additional Options' page of the Active Directory Domain Services Configuration Wizard. The title bar reads 'Active Directory Domain Services Configuration Wizard'. On the right, it says 'TARGET SERVER sys2'. The left sidebar contains a list of steps: Deployment Configuration, Domain Controller Options, DNS Options, **Additional Options** (highlighted), Paths, Review Options, and Prerequisites Check. The main area is titled 'Specify Install From Media (IFM) Options' and includes a checkbox for 'Install from media' which is unchecked. Below this is the 'Specify additional replication options' section, with a 'Replicate from:' dropdown menu. The dropdown is open, showing three options: 'sys1.Microsoft.com' (selected), 'Any domain controller', and 'sys1 Microsoft.com'. At the bottom, there are navigation buttons: '< Previous', 'Next >', and 'Cancel'. A link 'More about additional options' is also present.

19. Verify the location of the AD DS database, log files, and SYSVOL, click **Next**.

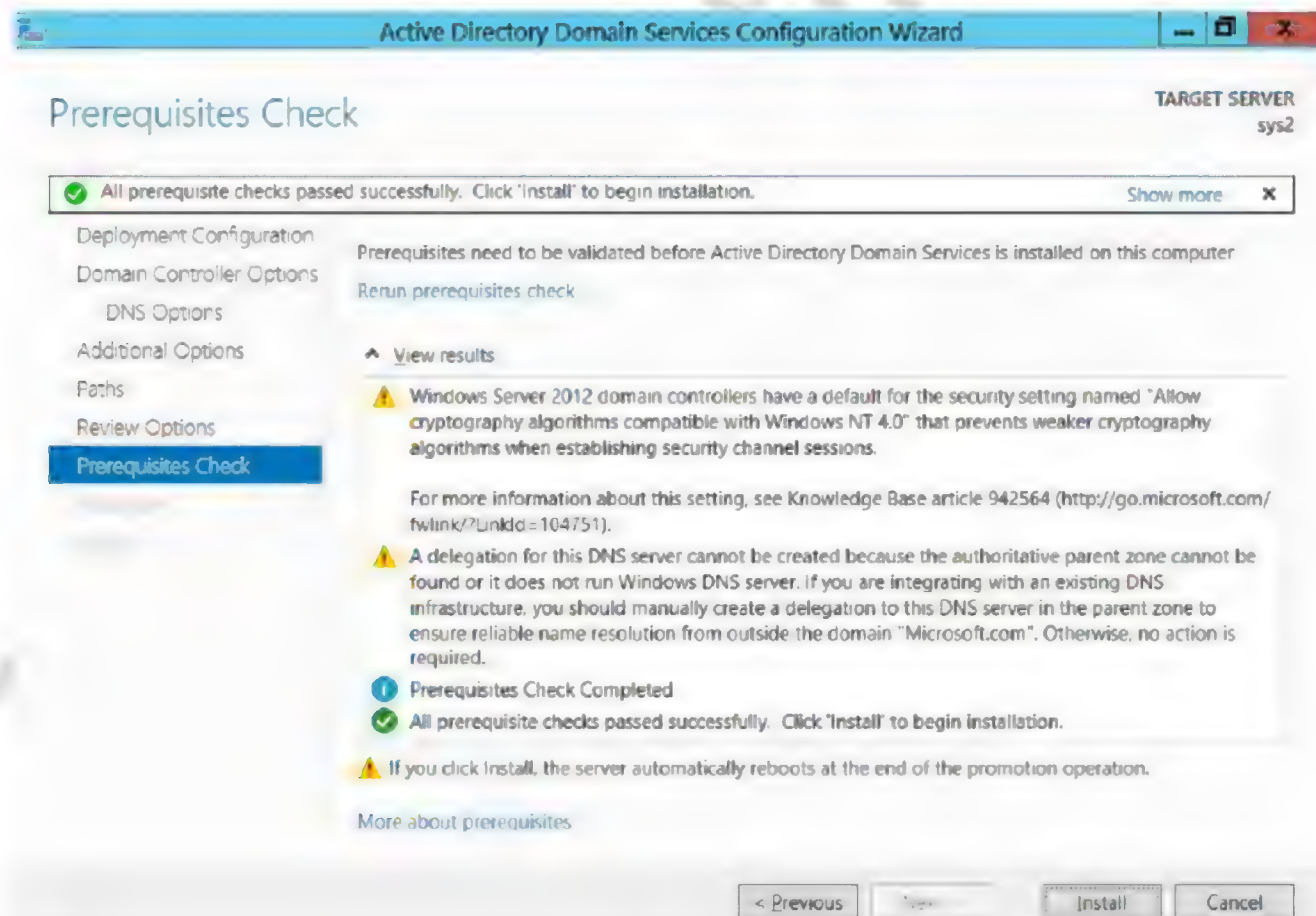
The screenshot shows the 'Paths' page of the Active Directory Domain Services Configuration Wizard. The title bar reads 'Active Directory Domain Services Configuration Wizard'. On the right, it says 'TARGET SERVER sys2'. The left sidebar contains a list of steps: Deployment Configuration, Domain Controller Options, DNS Options, Additional Options, **Paths** (highlighted), Review Options, and Prerequisites Check. The main area is titled 'Specify the location of the AD DS database, log files, and SYSVOL'. It contains three rows of text boxes for 'Database folder:', 'Log files folder:', and 'SYSVOL folder:'. The values entered are 'C:\Windows\NTDS', 'C:\Windows\NTDS', and 'C:\Windows\SYSVOL' respectively. To the right of each text box is a small button with a folder icon. At the bottom, there are navigation buttons: '< Previous', 'Next >', and 'Cancel'. A link 'More about Active Directory paths' is also present.



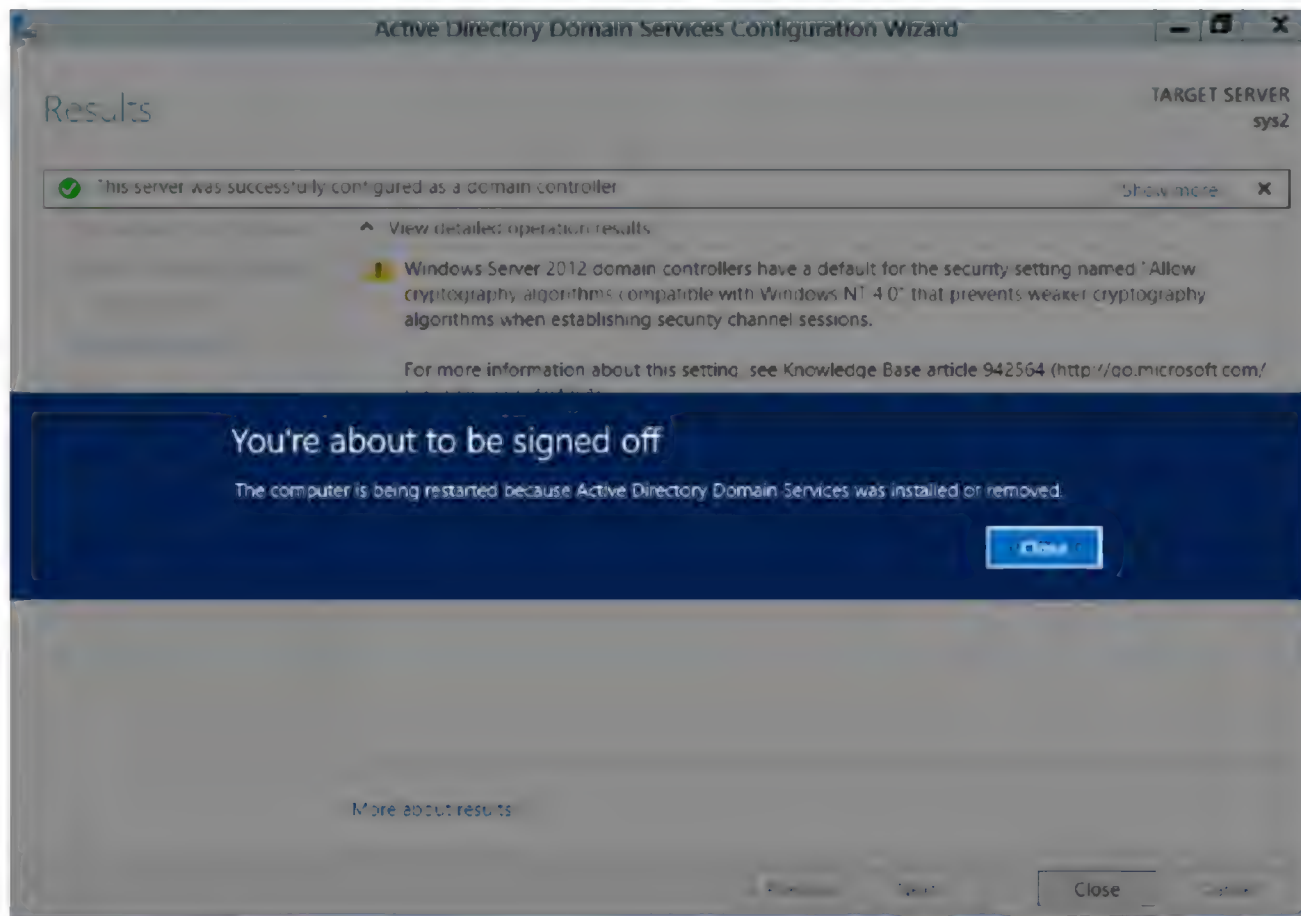
20. Review the Summary and click **Next**.



21. Click **Install** to begin installation.



22. The computer restarts as a part of Active Directory Domain Services installation.



23. After restarting the computer **Active directory** will be installed.

**Verification:**

1. Click Start → **Run** and type **CMD**.
2. Type **NET ACCOUNTS** and verify for **Backup** in Computer role.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator.Microsoft>net accounts
Force user logoff how long after time expires?:      Never
Minimum password age (days):                        1
Maximum password age (days):                        42
Minimum password length:                             7
Length of password history maintained:               24
Lockout threshold:                                   Never
Lockout duration (minutes):                          30
Lockout observation window (minutes):                 30
Computer role:                                       BACKUP
The command completed successfully.

C:\Users\Administrator.Microsoft>
```



## Lab – 27: Creating Child Domain

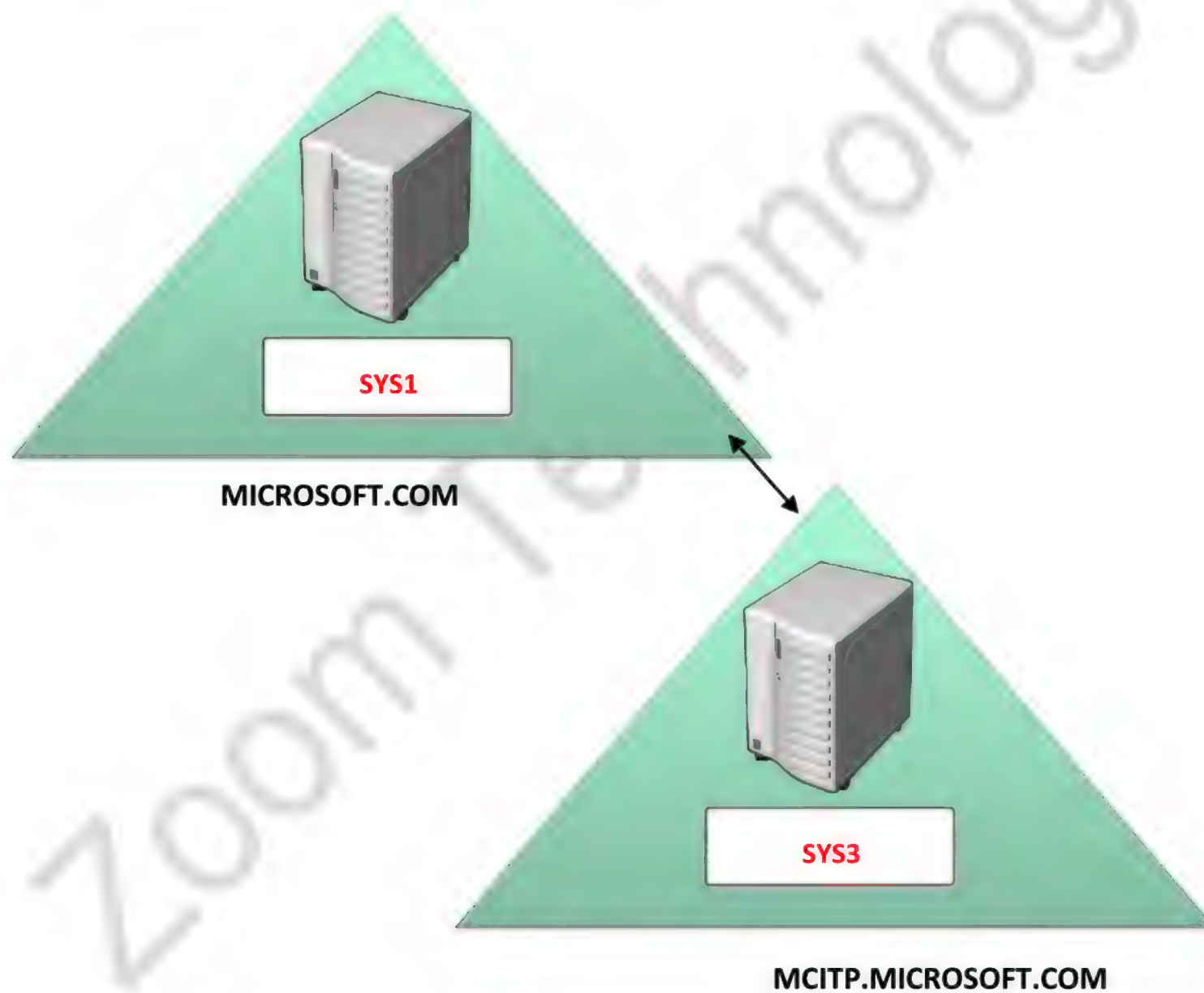
### Objective:

To create child domain

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server.



### SYS1

#### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	-----

### SYS3

#### Workgroup

IP Address	10.0.0.3
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.3
Alternate DNS	10.0.0.1

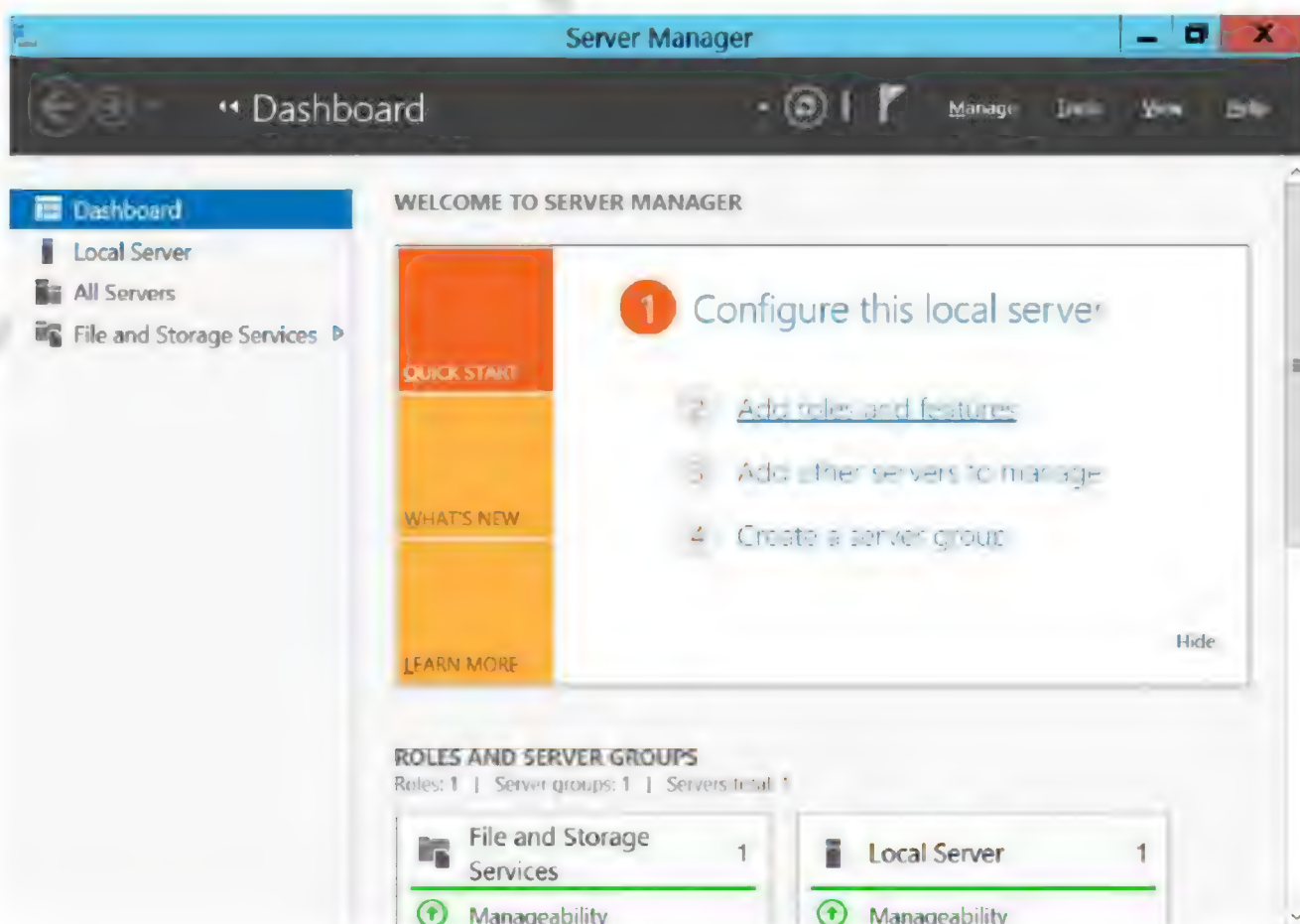


**Steps:**

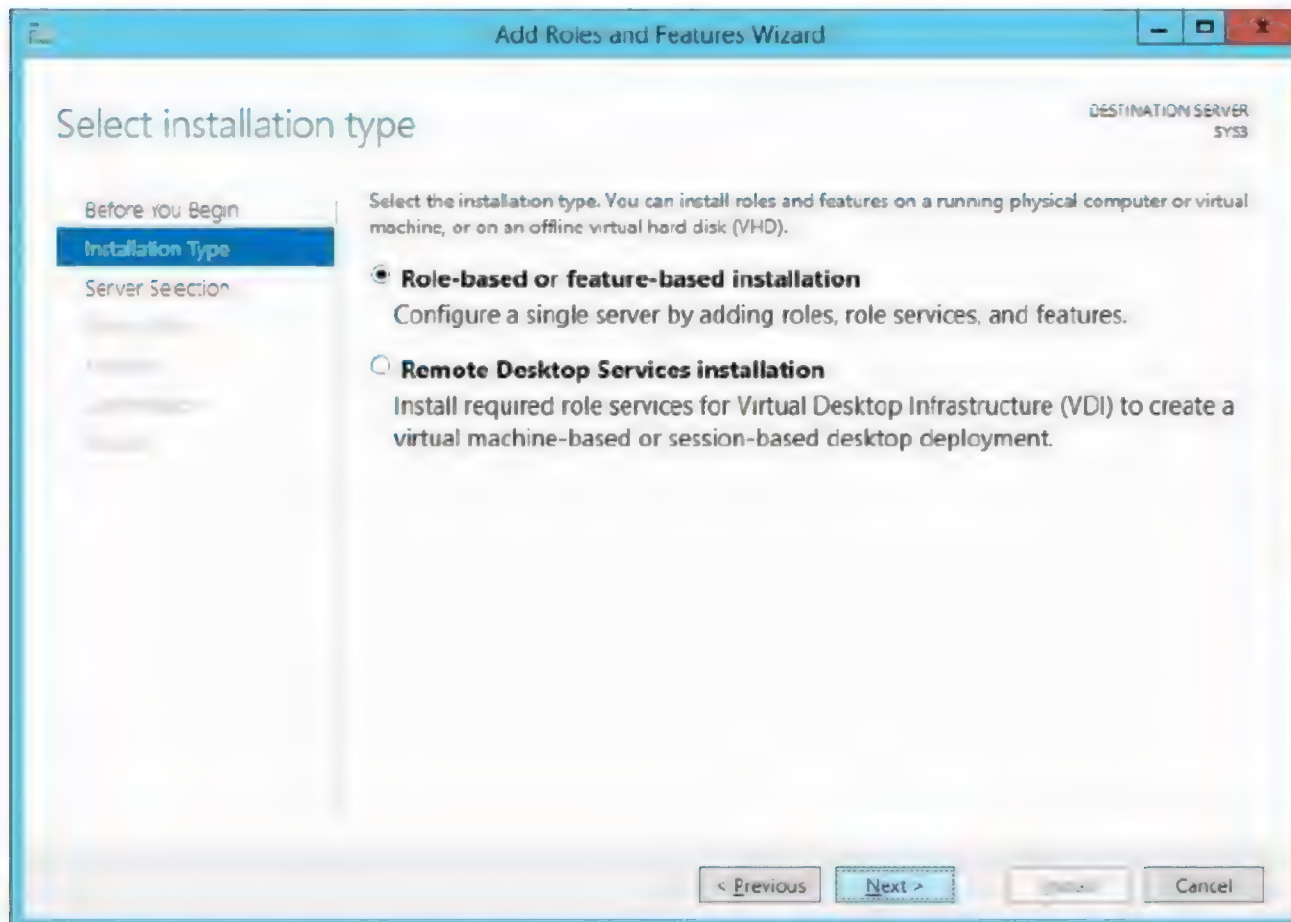
1. Log in as Administrator to the **Workgroup Computer**.
2. Assign **IP Address** and preferred **DNS Server Address**
3. Click **Server Manager**



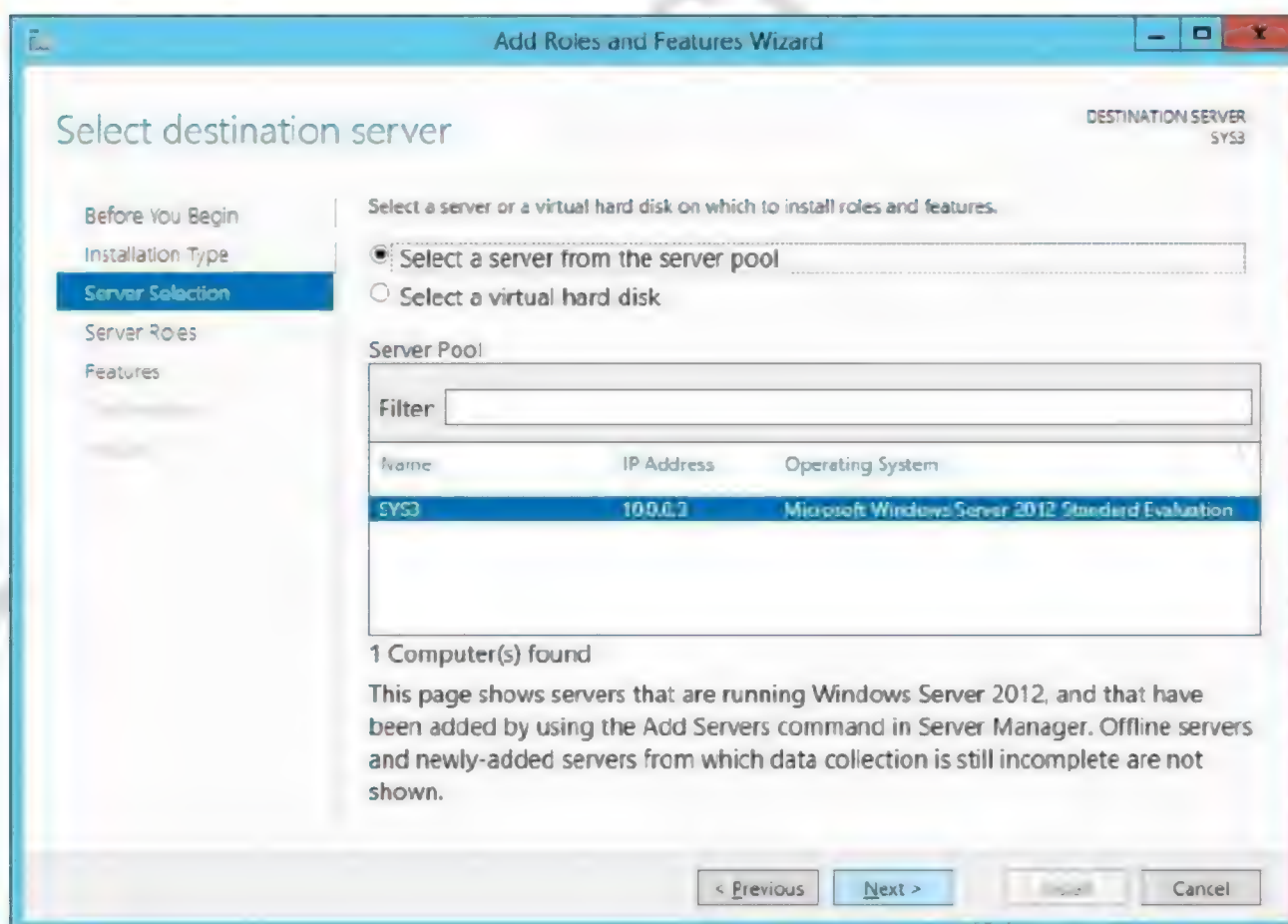
4. In Server Manager Dashboard, Click **Add roles and features**.



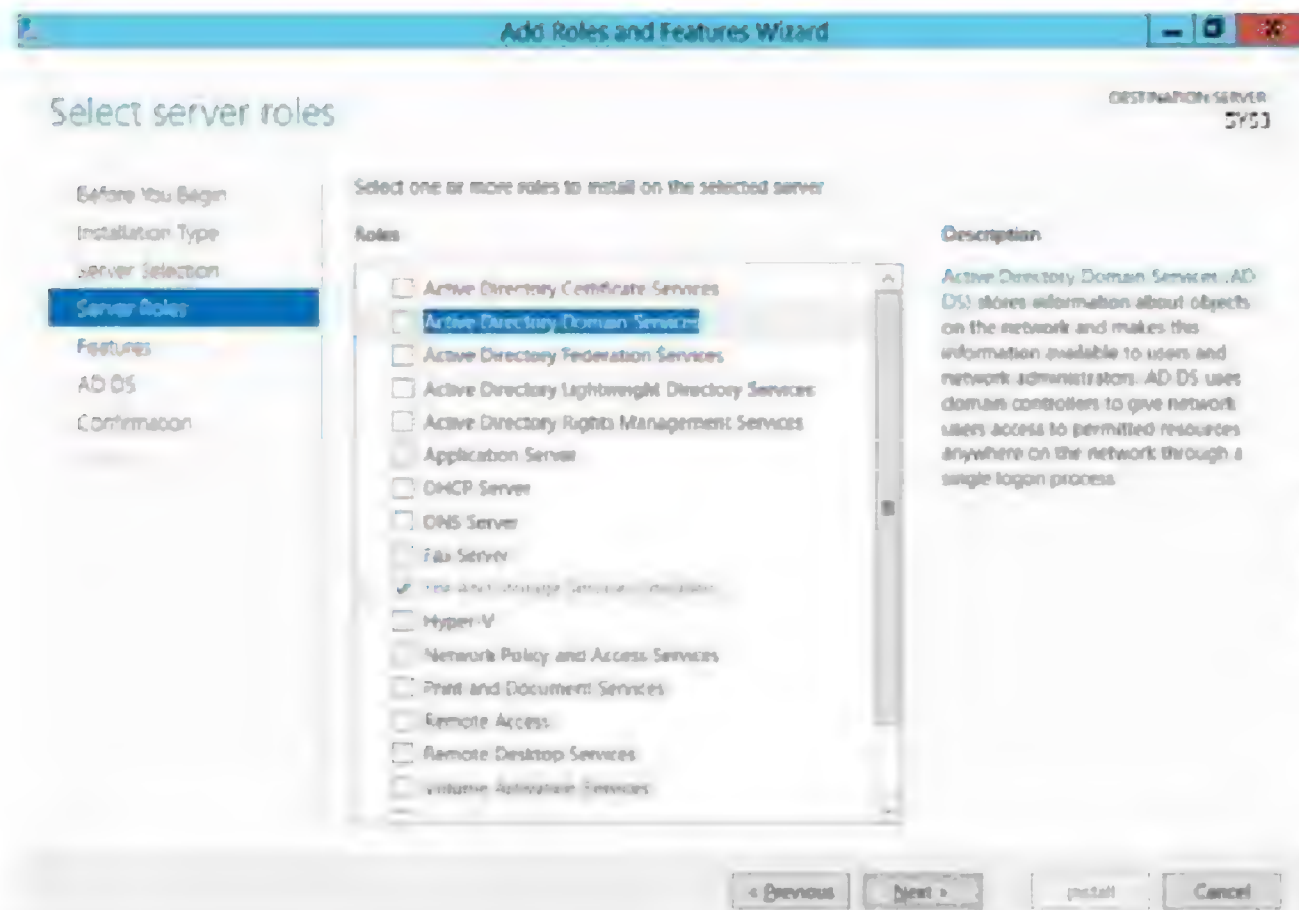
5. In Before you begin page, click **Next**, In Select installation type, select **Role-based or feature-based installation**, and click **Next**.



6. In Select destination server, from Server Pool select **SYS2**, click **Next**.



7. In Roles, check the box **Active Directory Domain Services**.

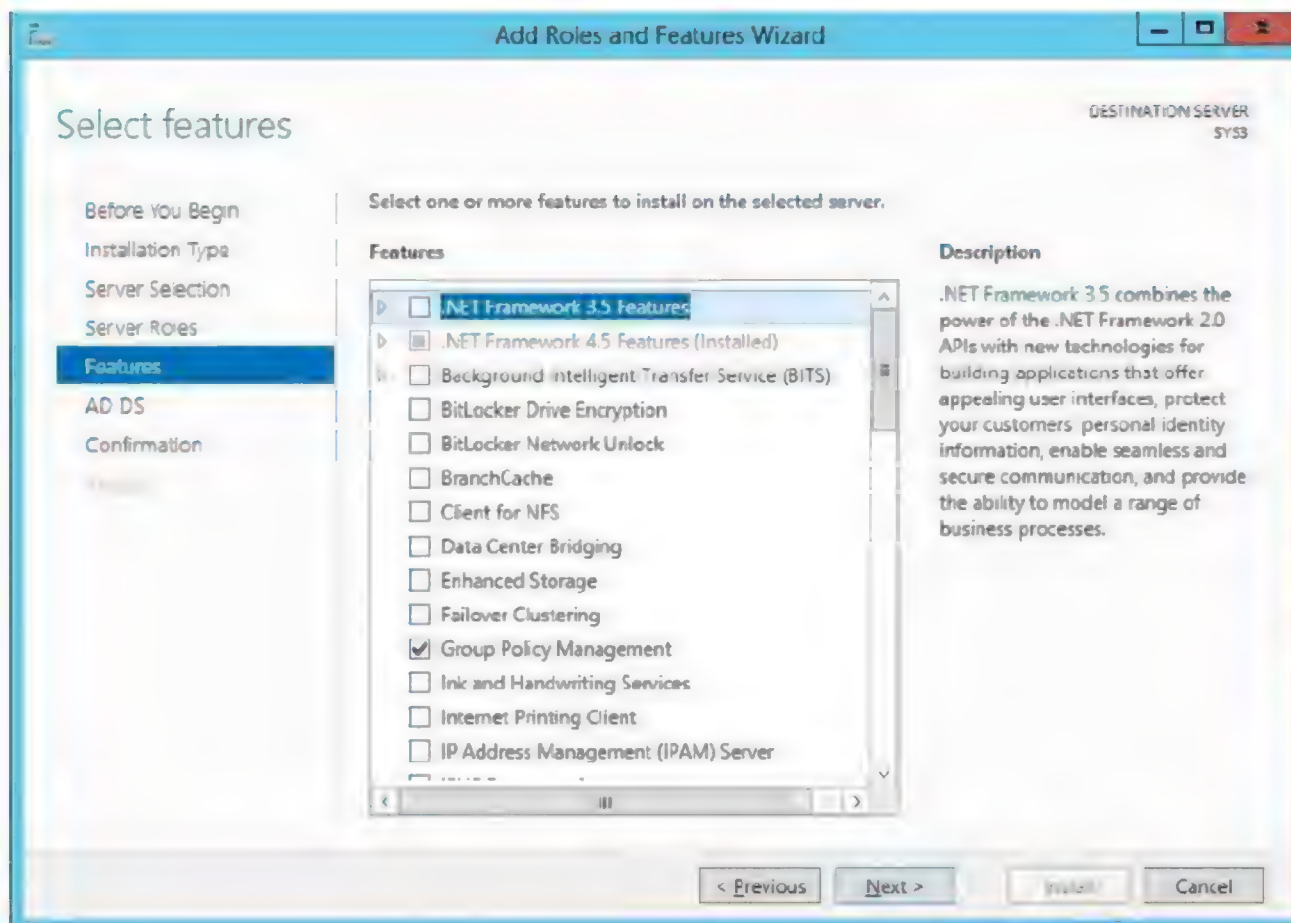


8. Click **Add Features**, to install the required features for Active Directory Domain Services. Click **Next**.

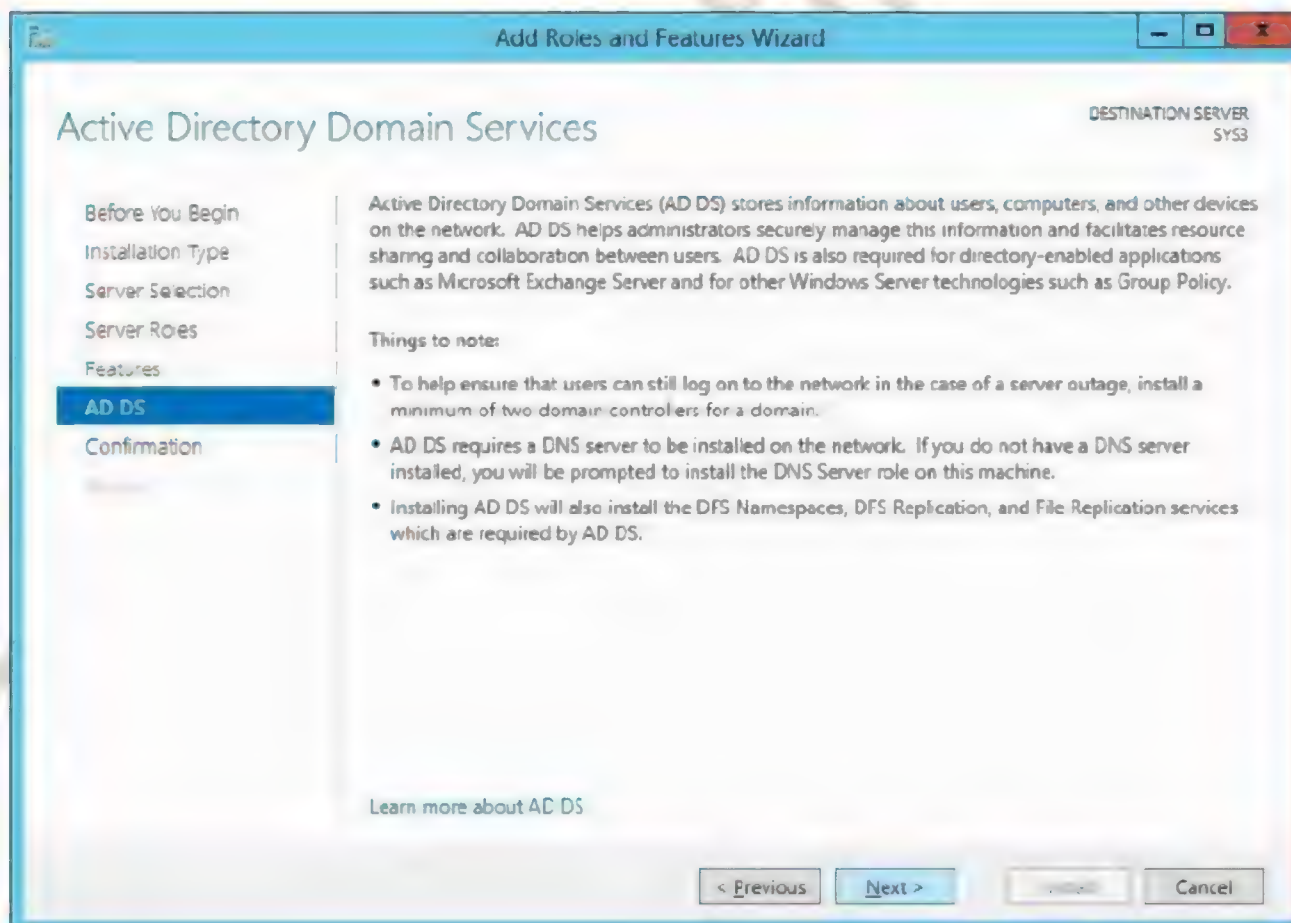




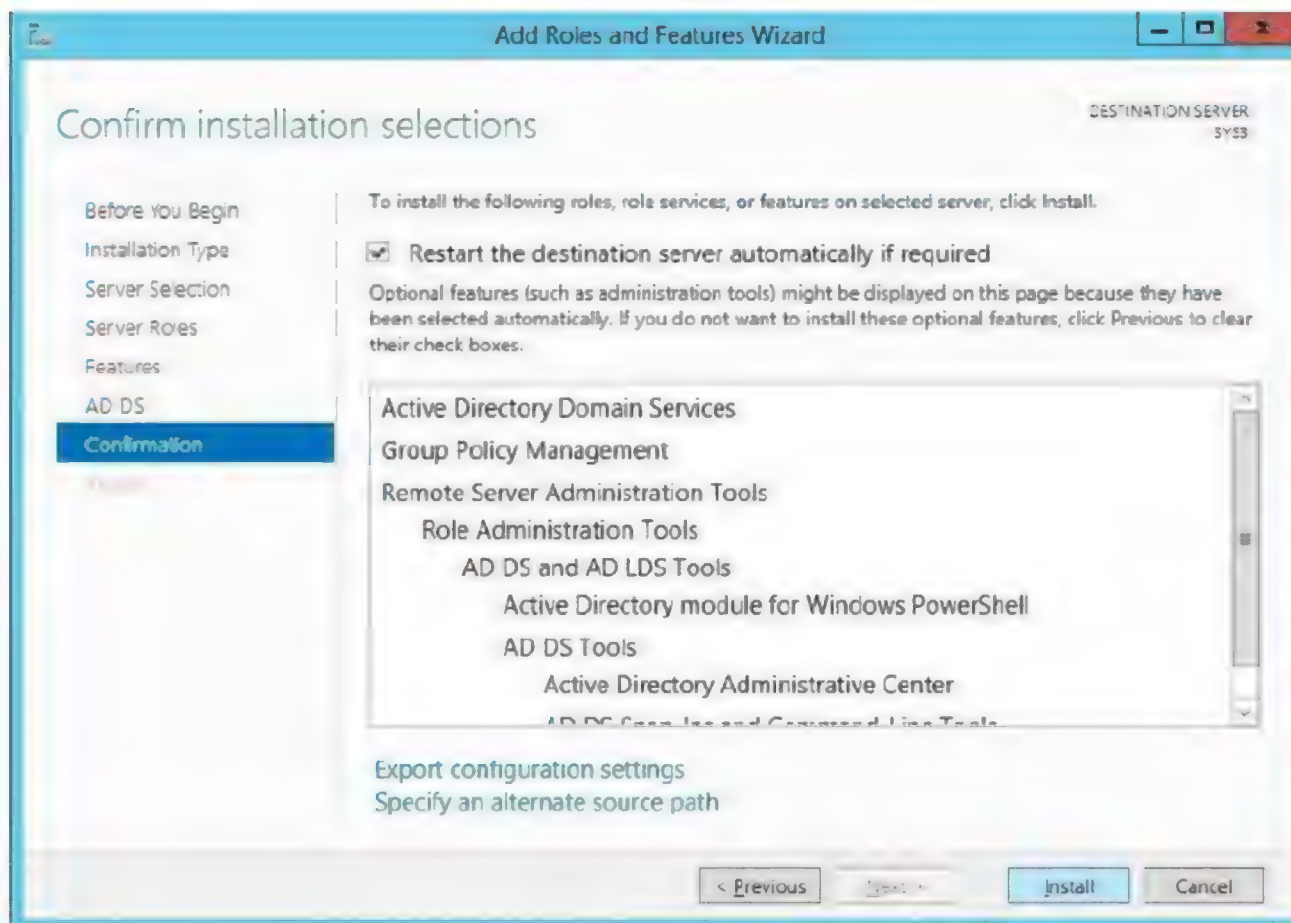
9. In Select features wizard, click **Next**.



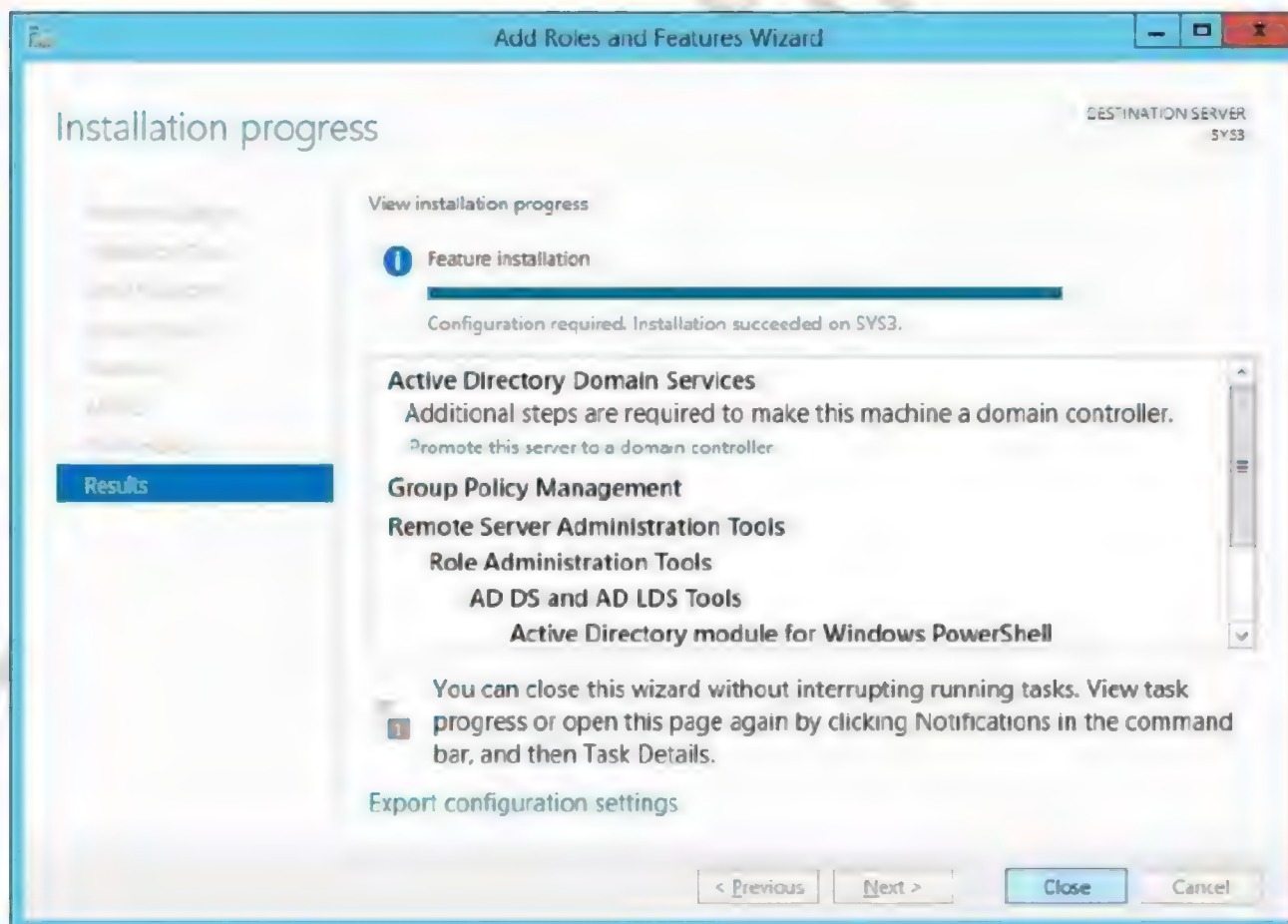
10. In Active Directory Domain Services wizard, click **Next**.



11. Check the box **Restart the destination server automatically if required**. Click **Install**.

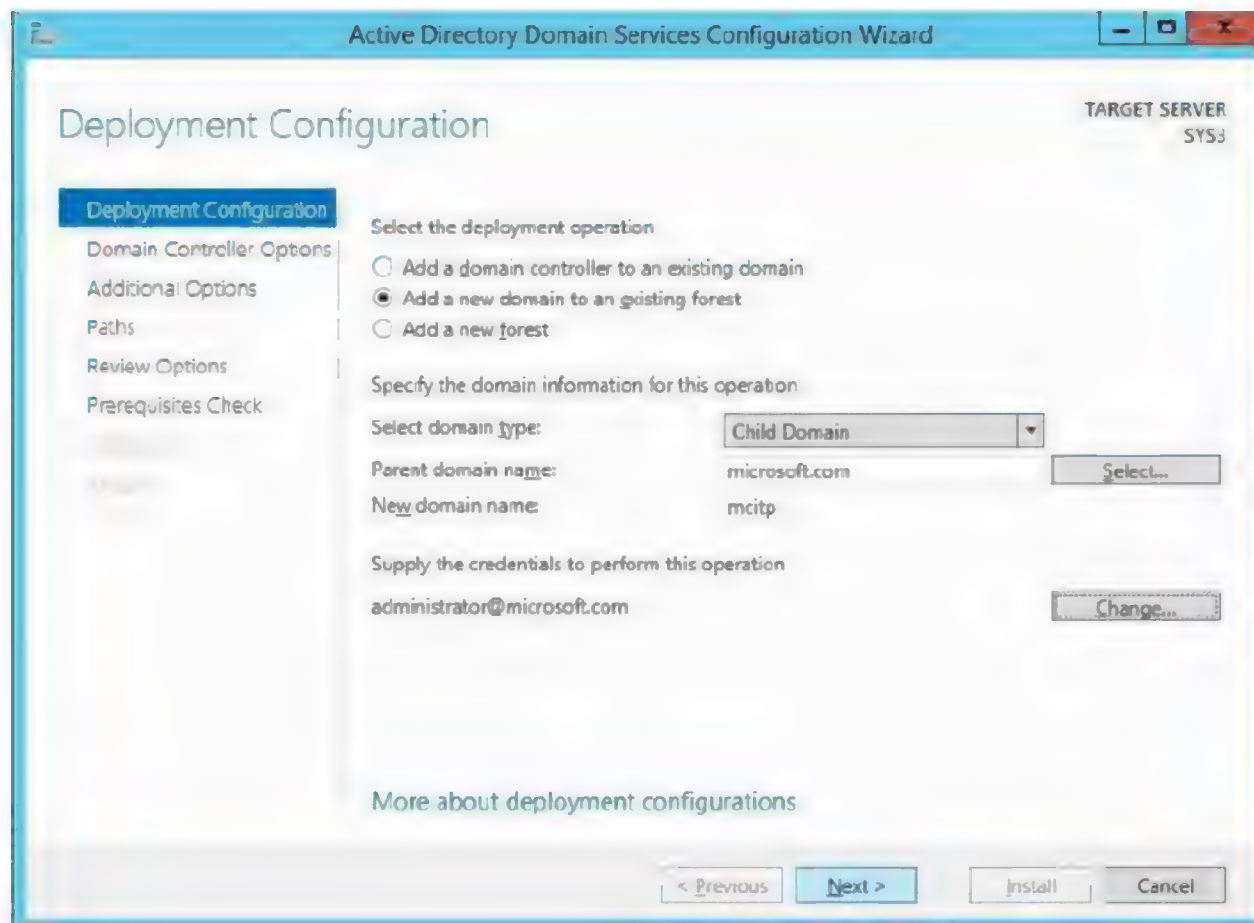


12. Click **Promote this server to a domain controller**.





13. In Deployment Configuration wizard, select **Add a new domain to an existing forest**, select domain type **Child Domain**, enter the Parent domain name (Ex: **Microsoft.com**) and New domain name (Ex: **mcitp**), and click **Change**.



14. Enter User Name: Administrator@microsoft.com and Password, click **OK**.



15. Click **Next**.



16. In Domain Controller Options, review the default settings, and type the Directory Services Restore Mode **Password** and **Confirm password** and click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main heading is 'Domain Controller Options'. On the left, a navigation pane lists: 'Deployment Configuration', 'Domain Controller Options' (selected), 'DNS Options', 'Additional Options', 'Paths', 'Review Options', and 'Prerequisites Check'. The main area contains the following settings:

- Target Server:** sys2
- Select functional level of the new domain:** Domain functional level: Windows Server 2003
- Specify domain controller capabilities and site information:**
  - ☒ Domain Name System (DNS) server
  - ☒ Global Catalog (GC)
  - ☐ Read only domain controller (RODC)
  - Site name:** Default-First-Site-Name
- Type the Directory Services Restore Mode (DSRM) password:**
  - Password:** [masked with dots]
  - Confirm password:** [masked with dots]

At the bottom, there is a link 'More about domain controller options' and buttons for '< Previous', 'Next >', 'Install', and 'Cancel'.

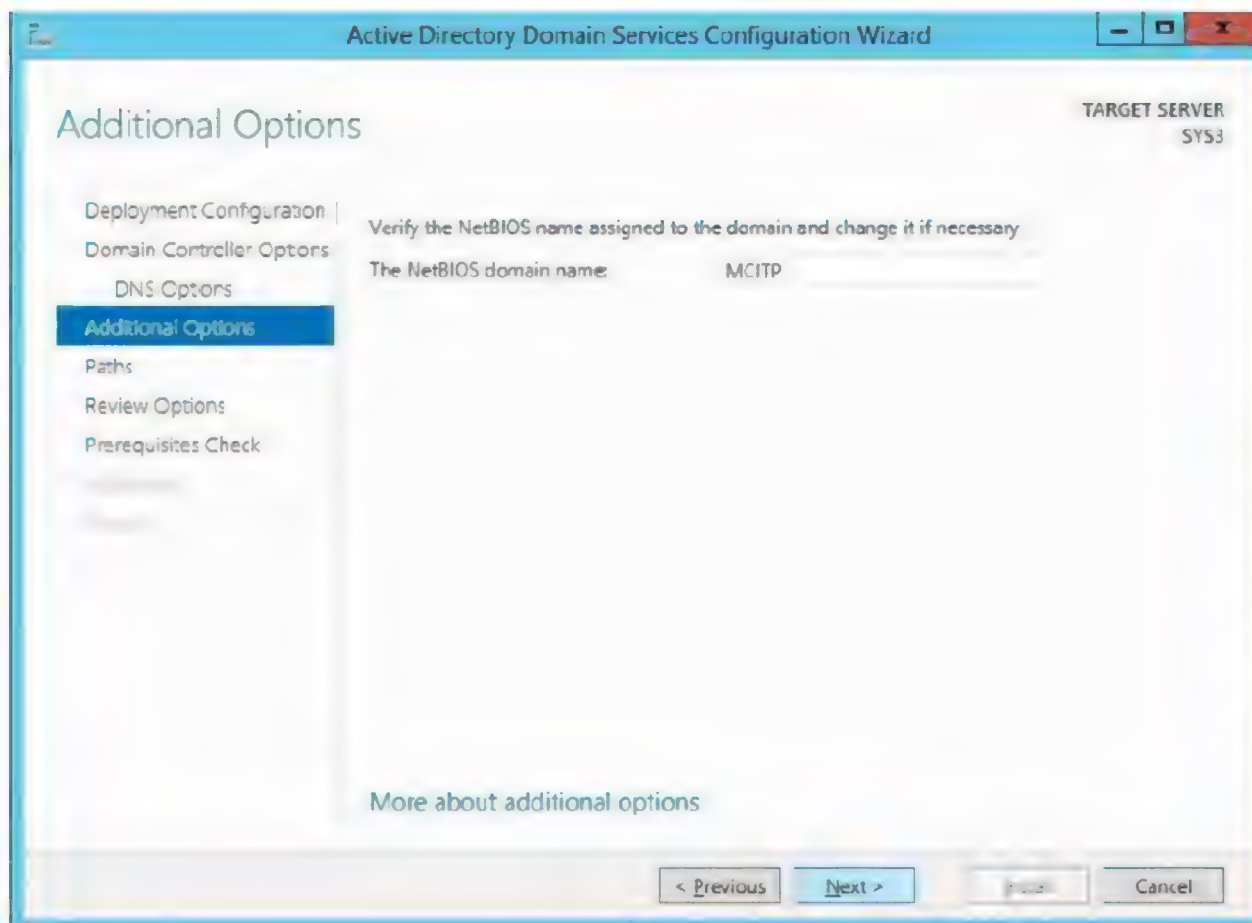
17. On DNS Options page, click **Next**.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main heading is 'DNS Options'. On the left, a navigation pane lists: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options' (selected), 'Additional Options', 'Paths', 'Review Options', and 'Prerequisites Check'. The main area contains the following settings:

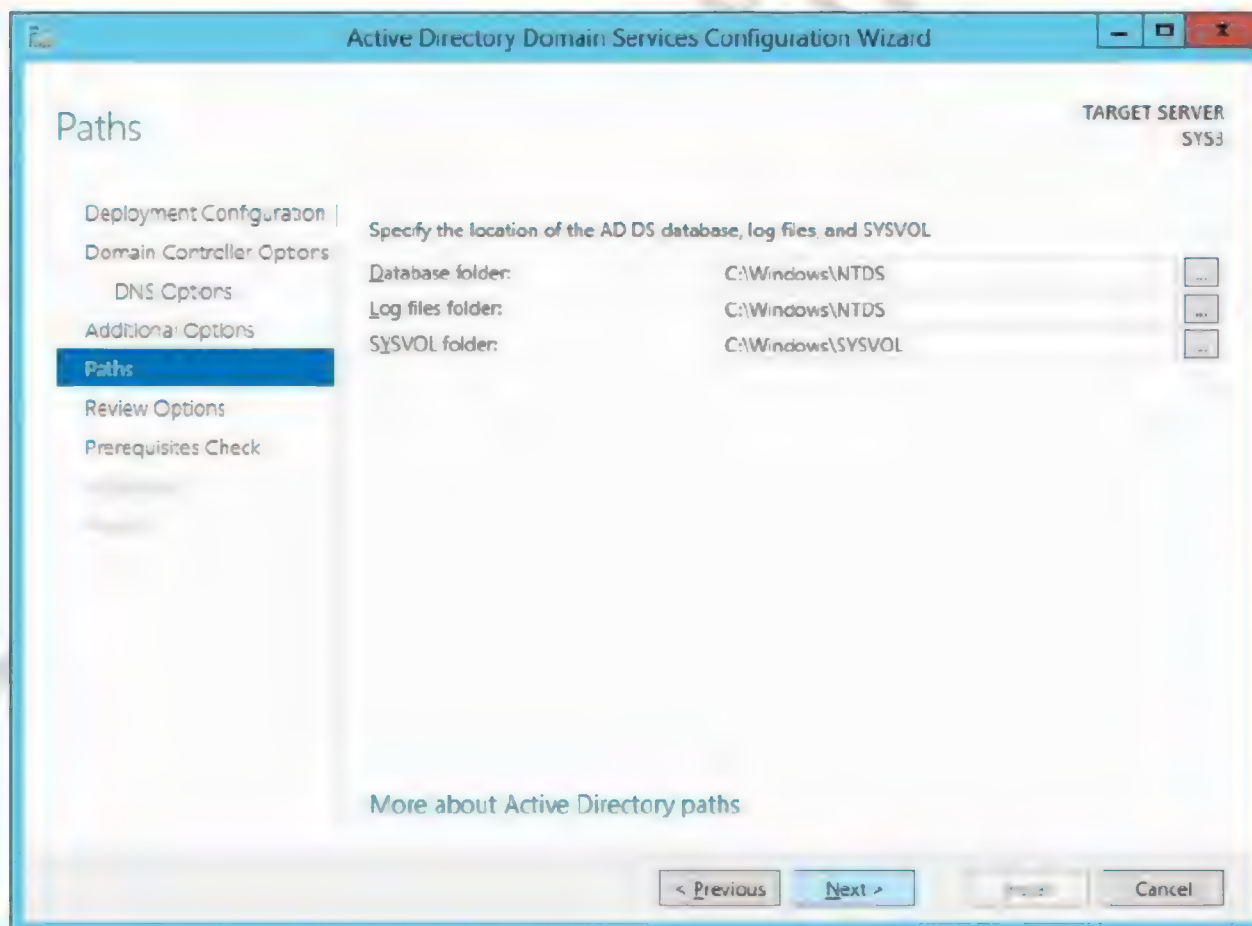
- Target Server:** SYS3
- Specify DNS delegation options:**
  - ☒ Create DNS delegation
- Credentials for delegation creation:** administrator@microsoft.com
- Change..** button

At the bottom, there is a link 'More about DNS delegation' and buttons for '< Previous', 'Next >', 'Install', and 'Cancel'.

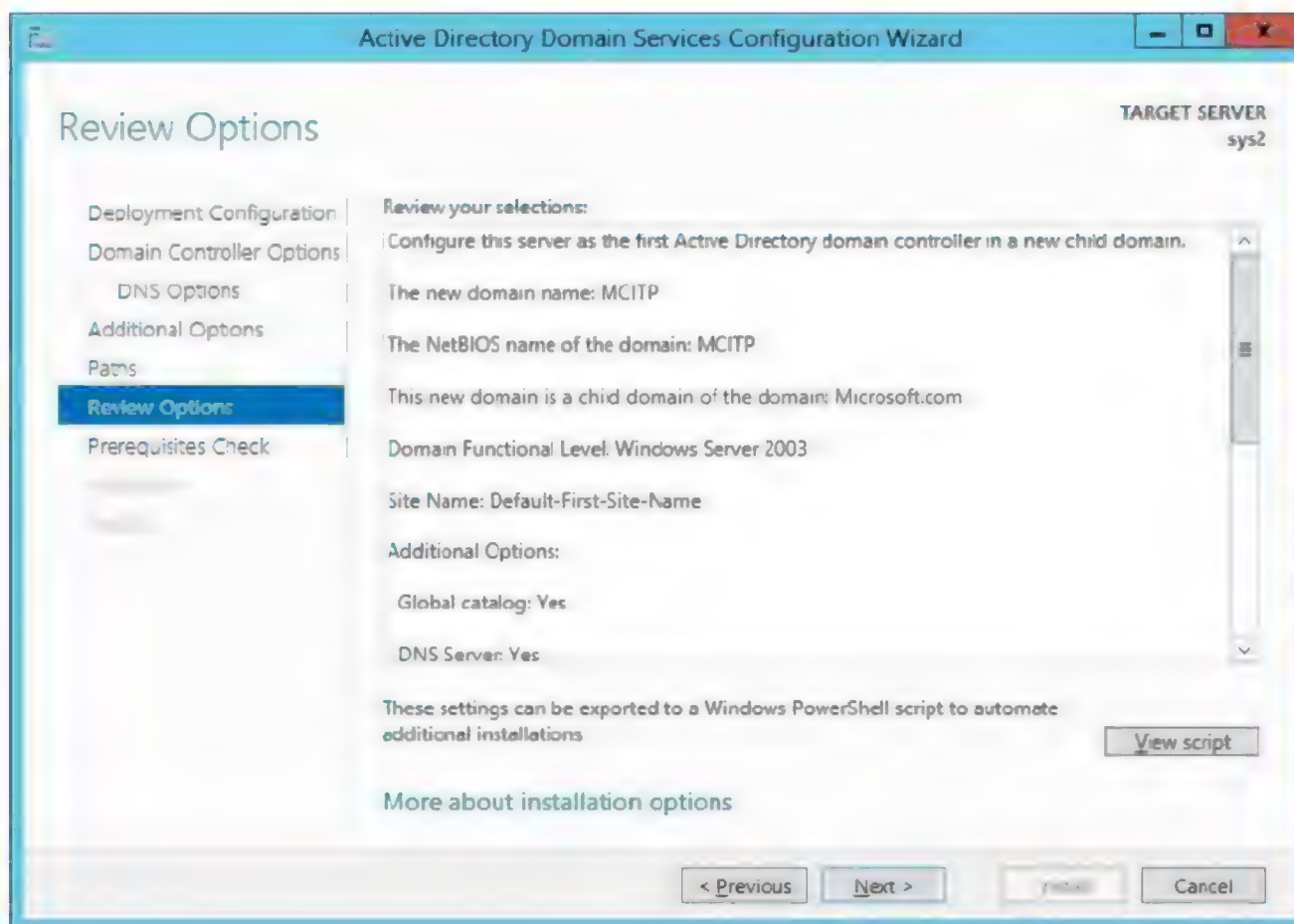
18. In Additional Options Page, Review the NetBIOS domain name (**MCITP**) click **Next**.



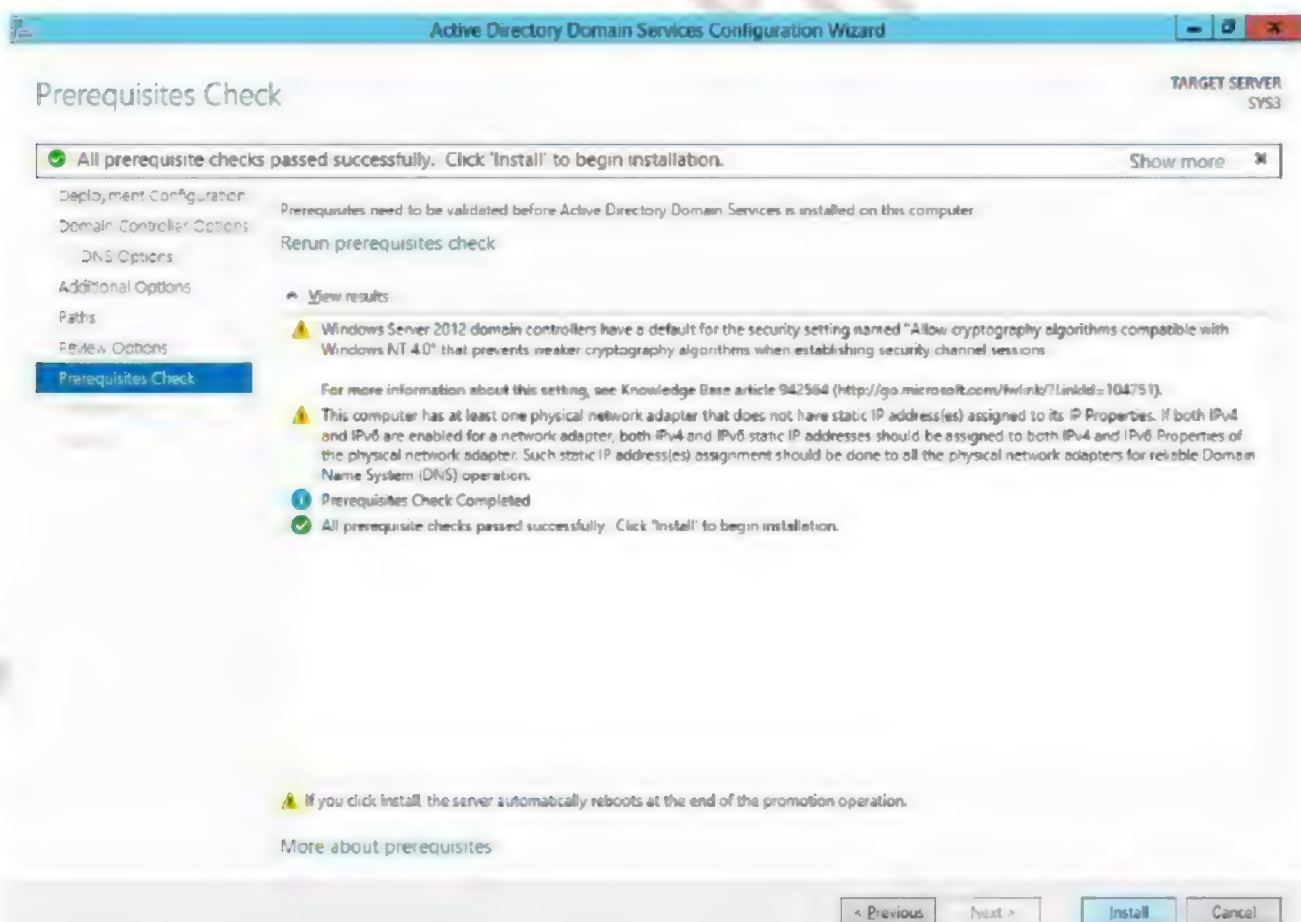
19. Verify the location of the AD DS database, log files, and SYSVOL, click **Next**.



20. Review the Summary and click **Next**.



21. Click **Install** to begin installation.



22. After restarting the computer **Active directory** will be installed.

**Verification:** Go to Server Manager, Local Server verify for Domain **MCITP.MICROSOFT.COM**

1. Go to **Active Directory Domains and Trusts** verify for parent and child domain. Example: **MICROSOFT.COM** and **MCITP.MICROSOFT.COM**.



## Lab – 28: Creating New Domain Tree in Existing Forest

### Objective:

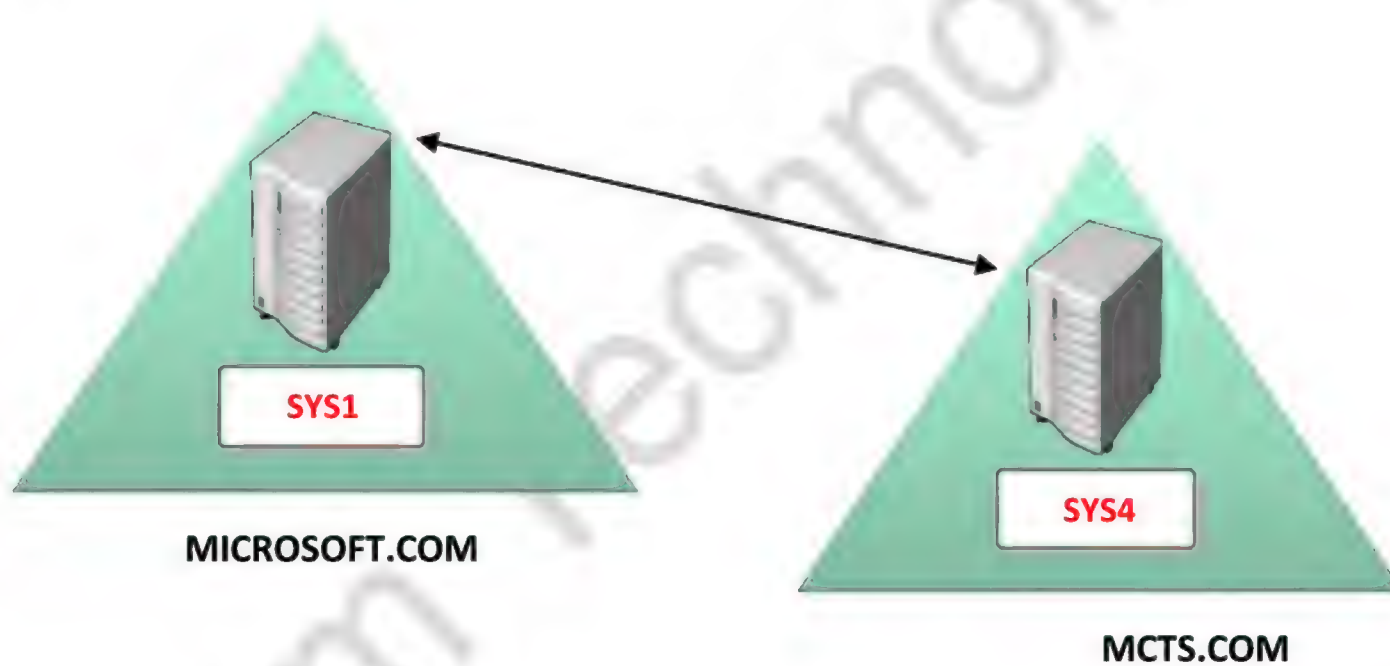
To create new tree domain in existing forest

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server.

### Topology:



#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	-----

#### SYS4

##### New Domain Tree

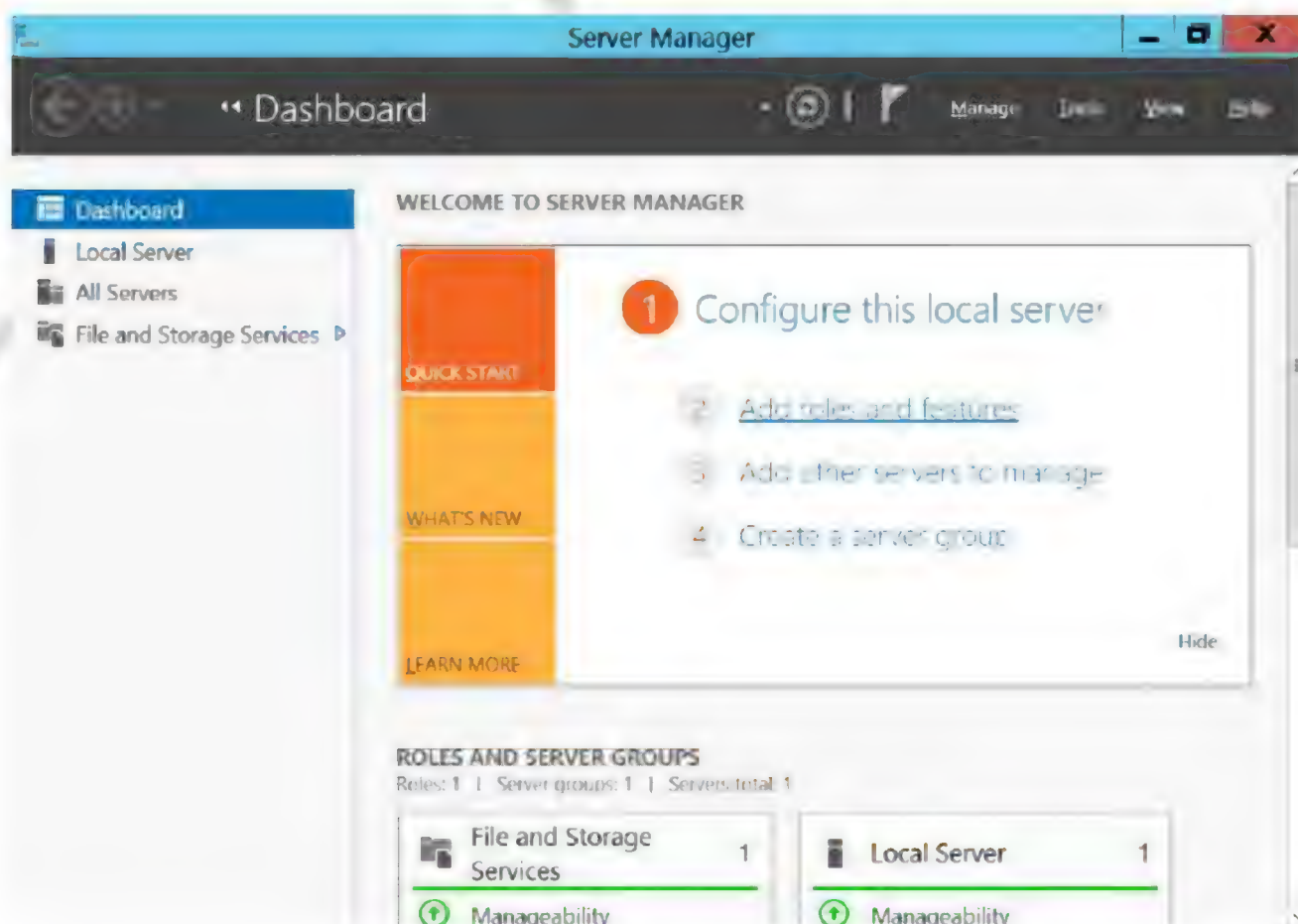
IP Address	10.0.0.4
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.4
Alternate DNS	10.0.0.1

**Steps:**

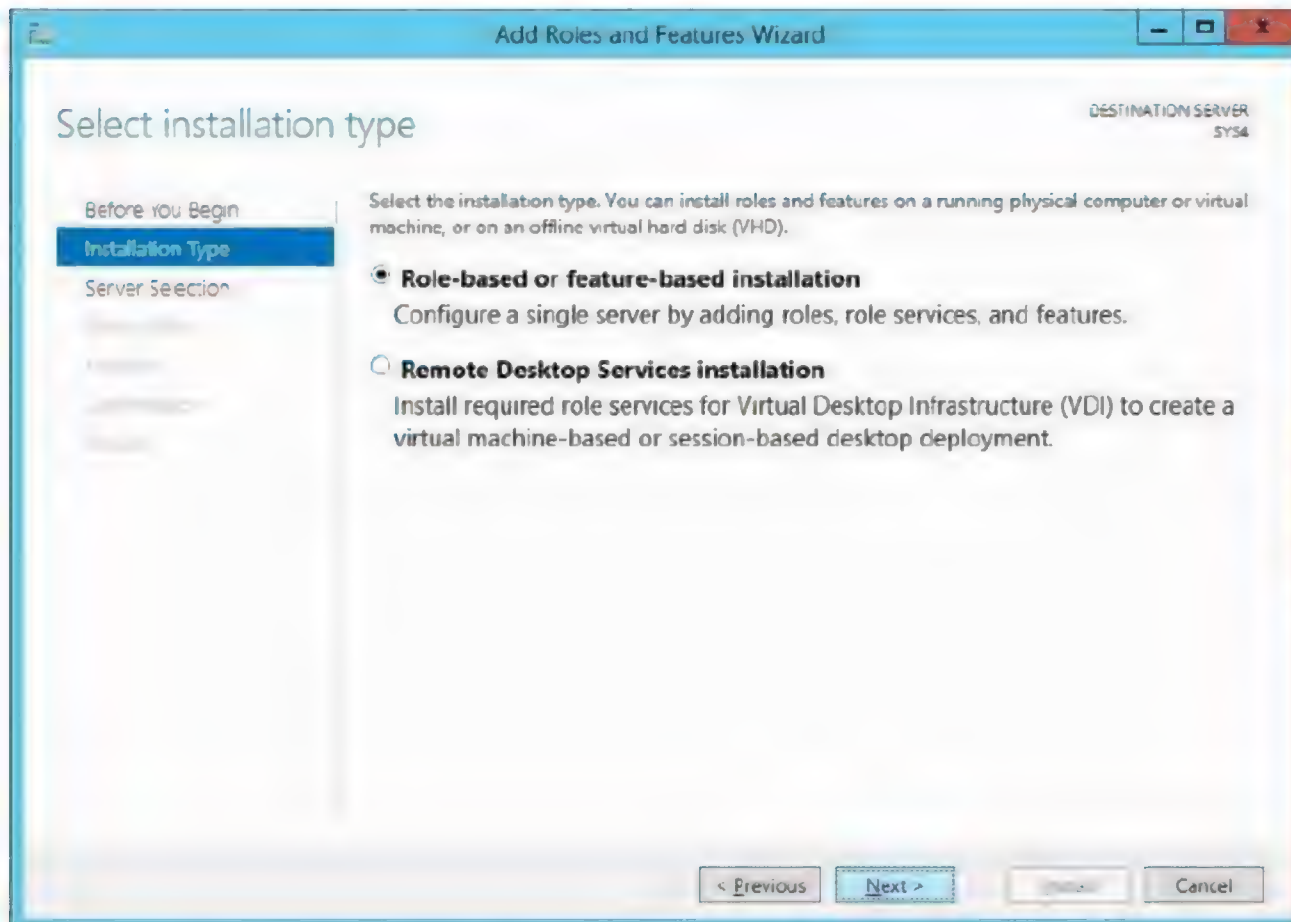
1. Log in as Administrator to the **Workgroup Computer**.
2. Assign **IP Address** and preferred **DNS Server Address**
3. Click Server Manager



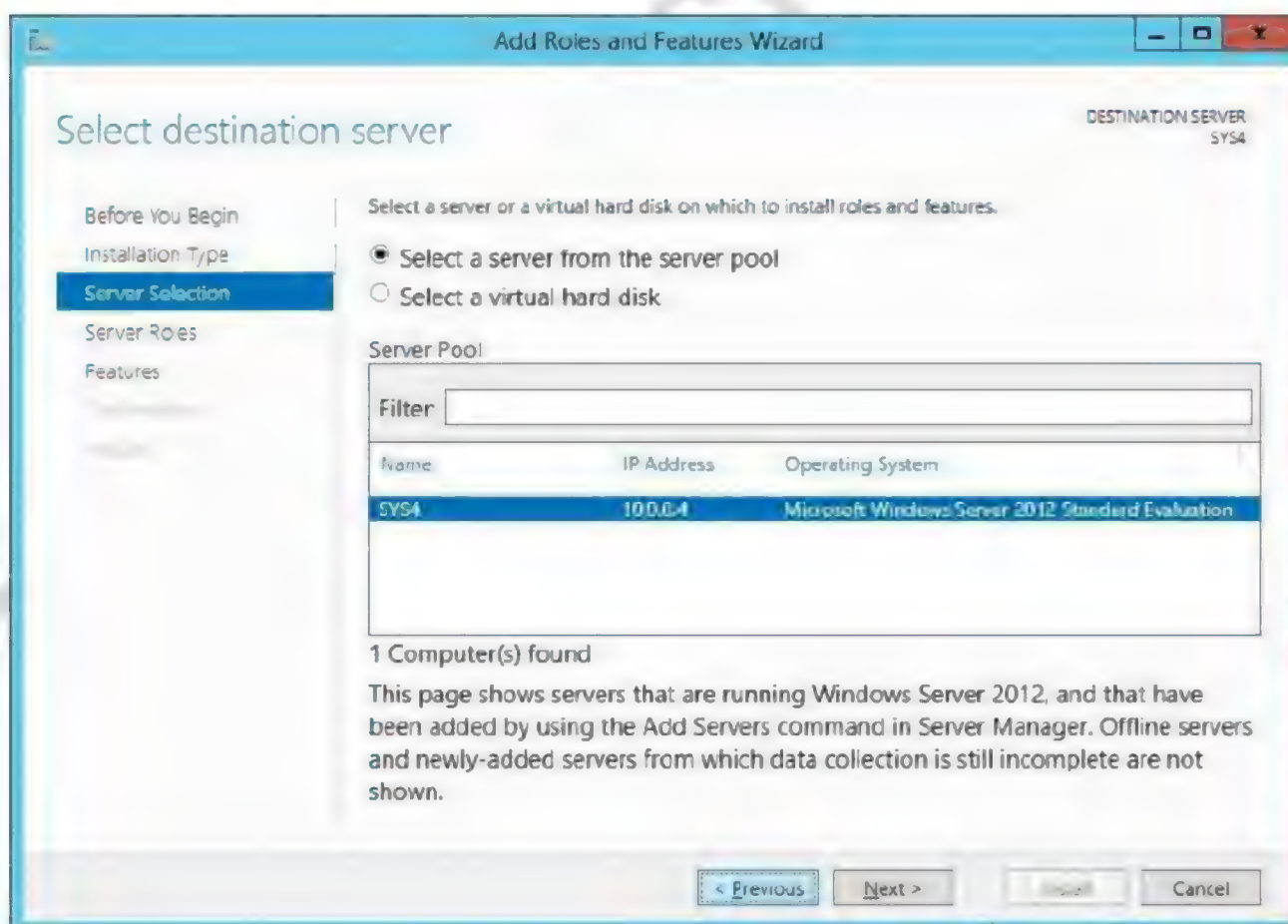
4. In Server Manager Dashboard, Click **Add roles and features**.



5. In before you begin page, click **Next**, In Select installation type, select **Role-based or feature-based installation**, and click **Next**.

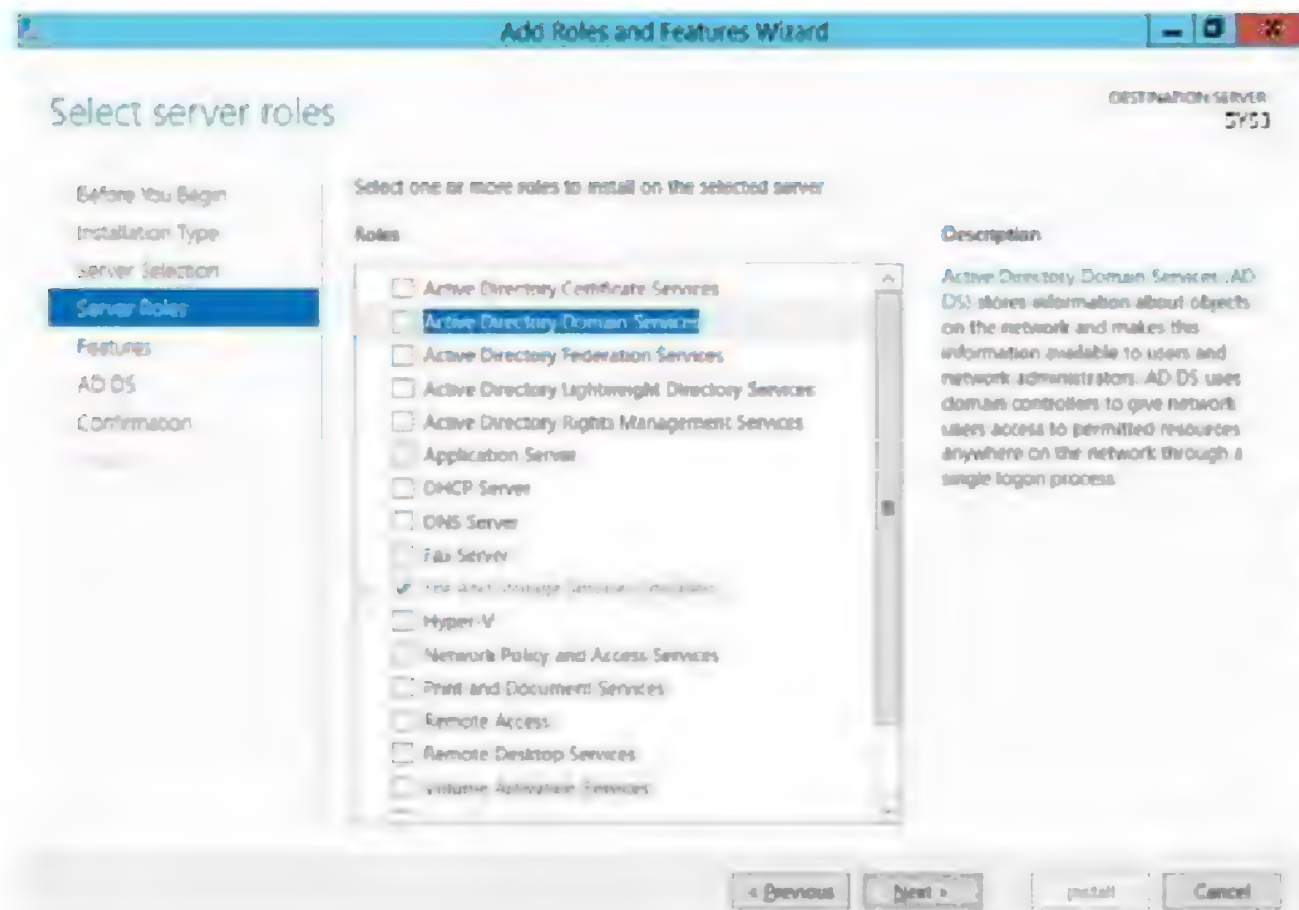


6. In Select destination server, from Server Pool select **SYS4**, click **Next**.

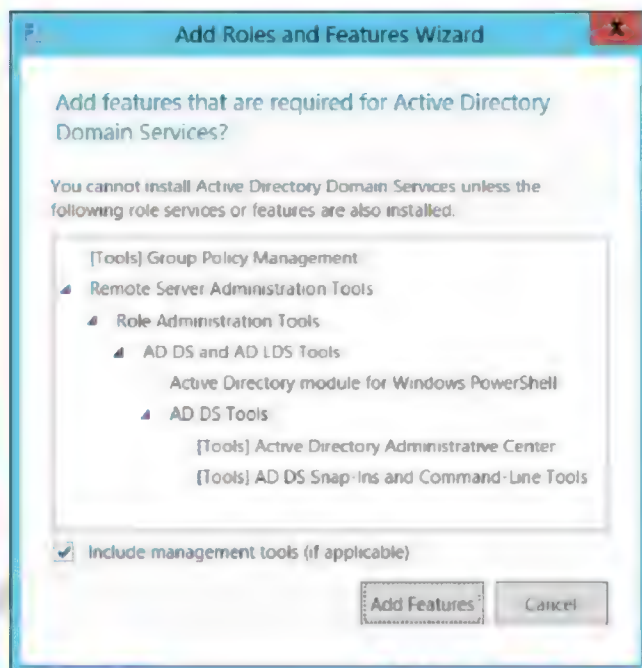




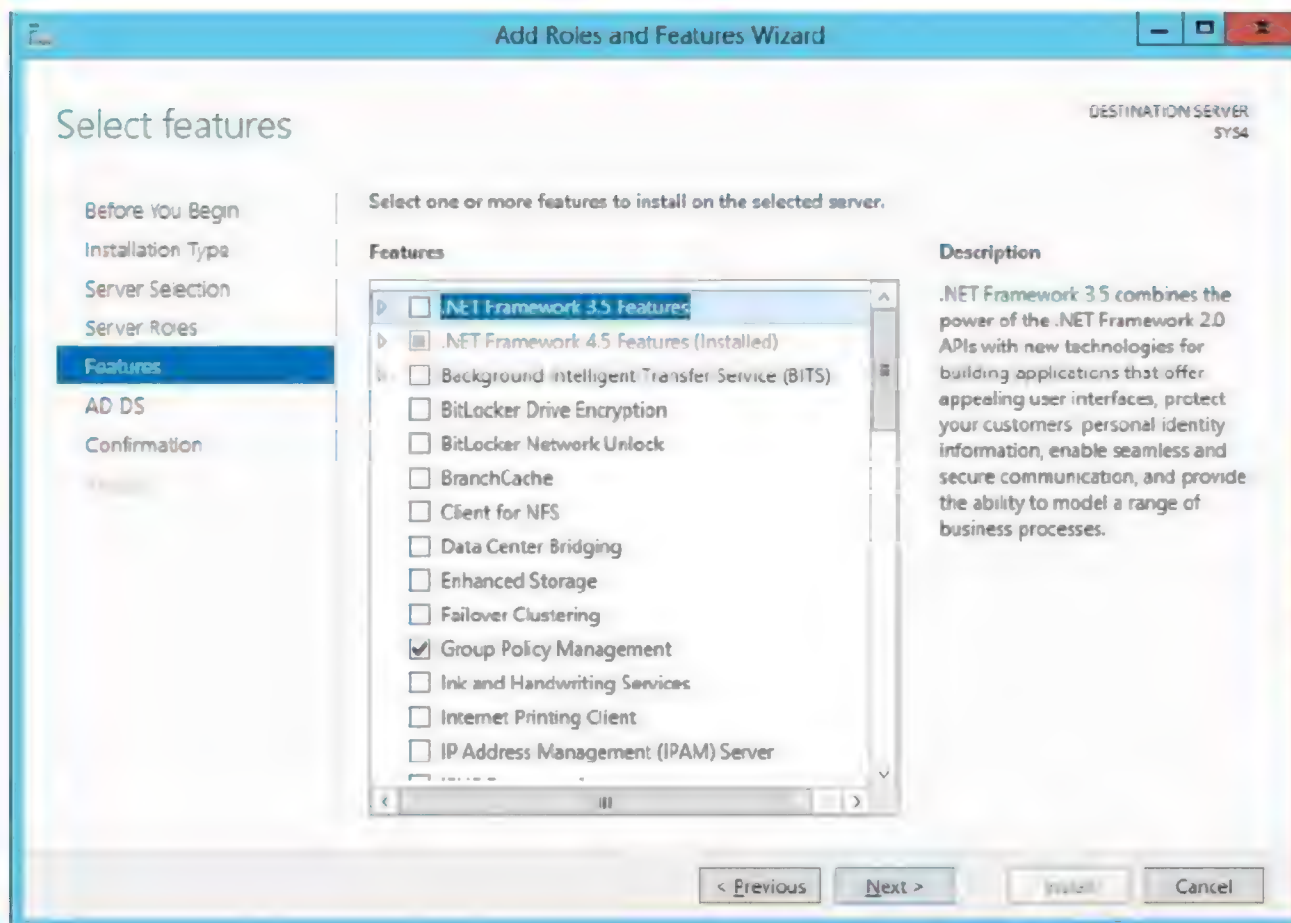
7. In Roles, check the box **Active Directory Domain Services**.



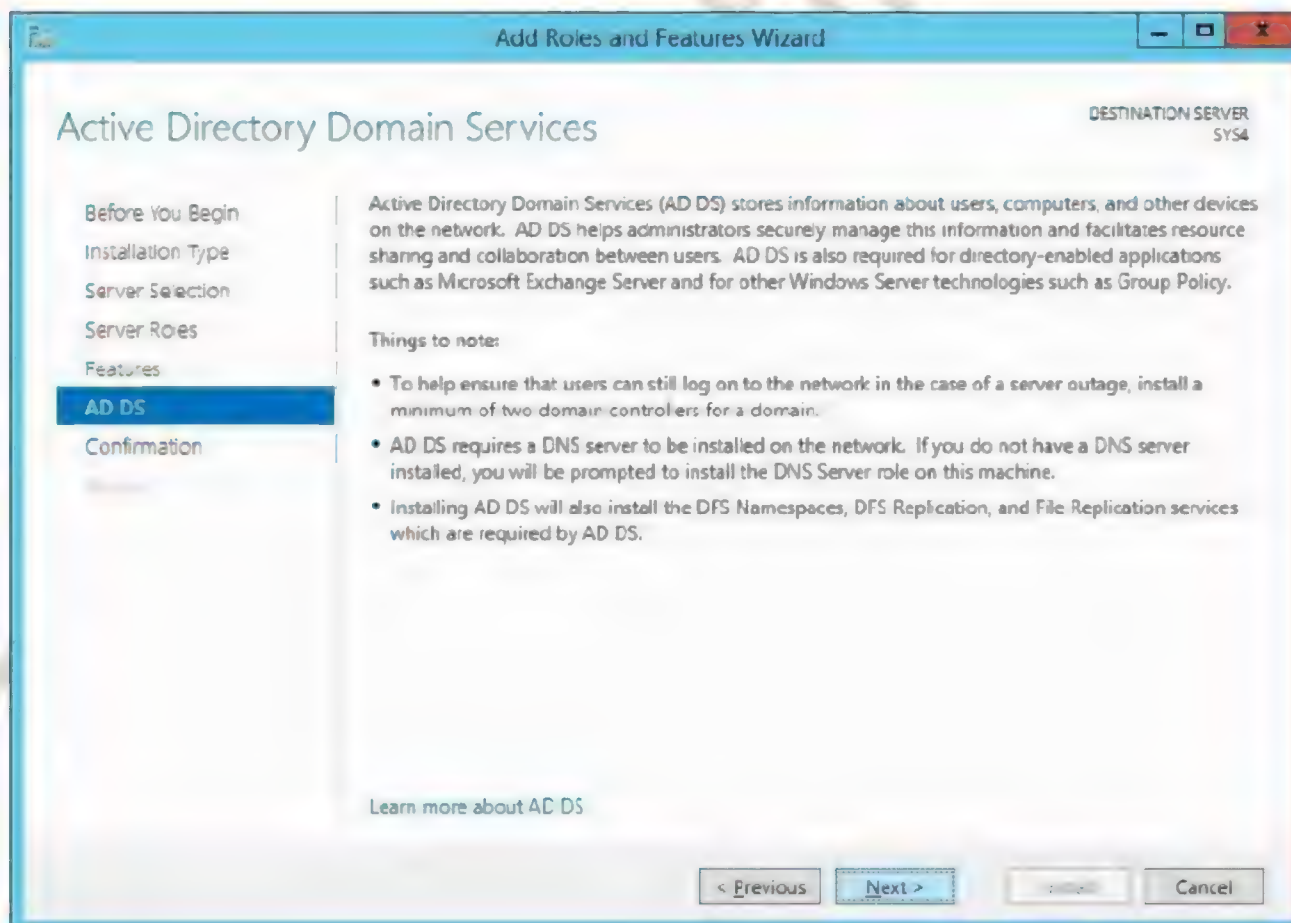
8. Click **Add Features**, to install the required features for Active Directory Domain Services. Click **Next**.



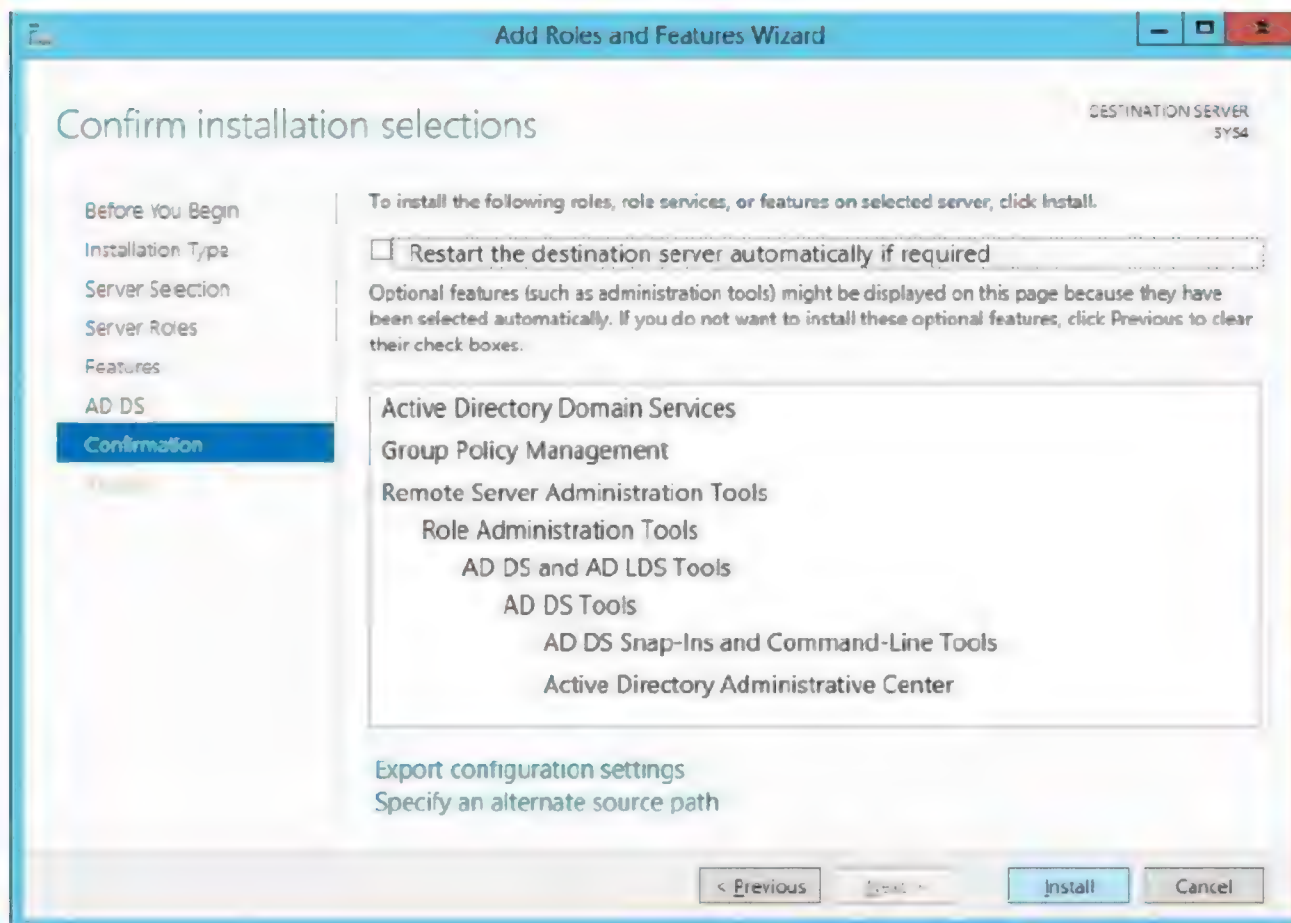
9. In Select features wizard, click **Next**.



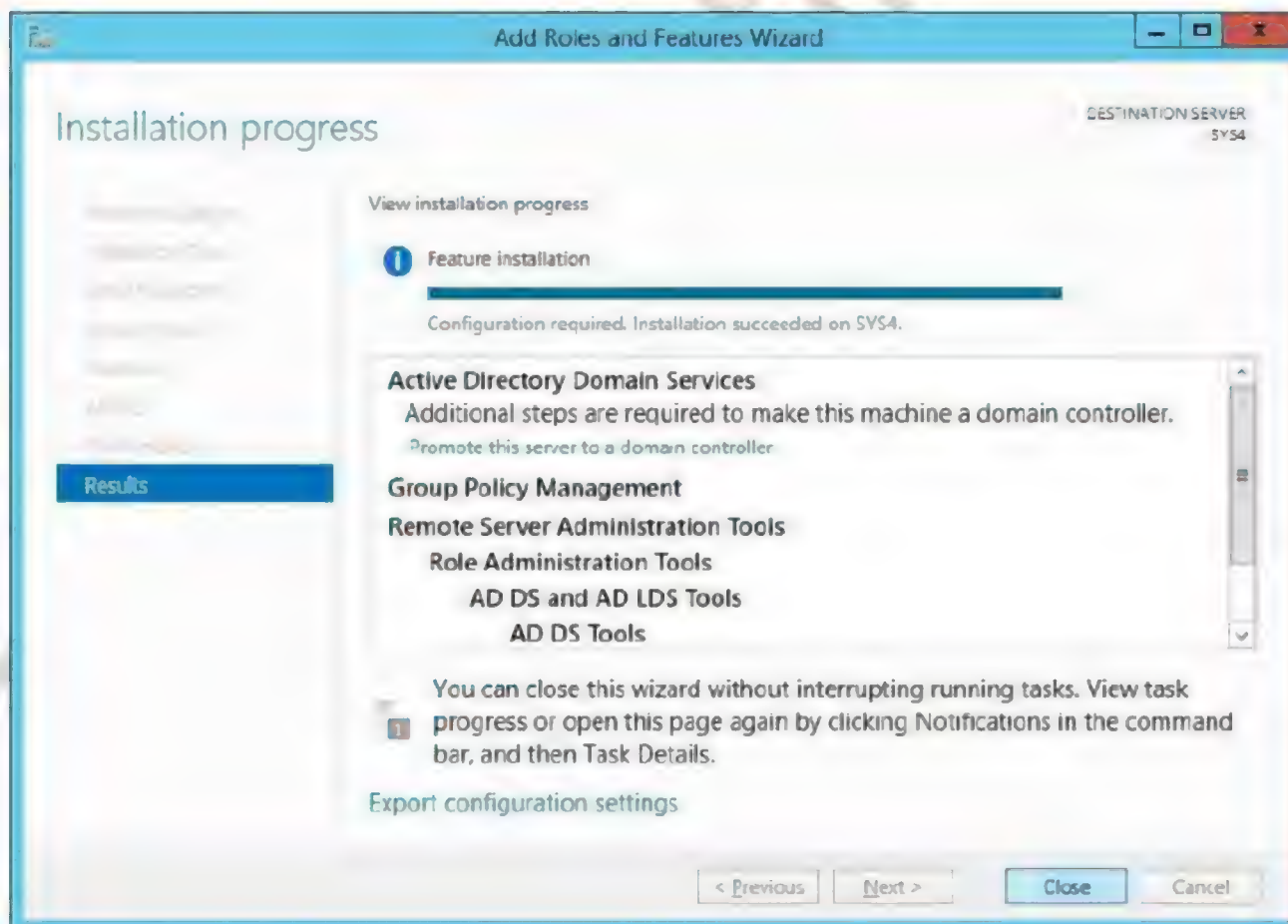
10. In Active Directory Domain Services wizard, click **Next**.



11. Check the box **Restart the destination server automatically if required**. Click **Install**.

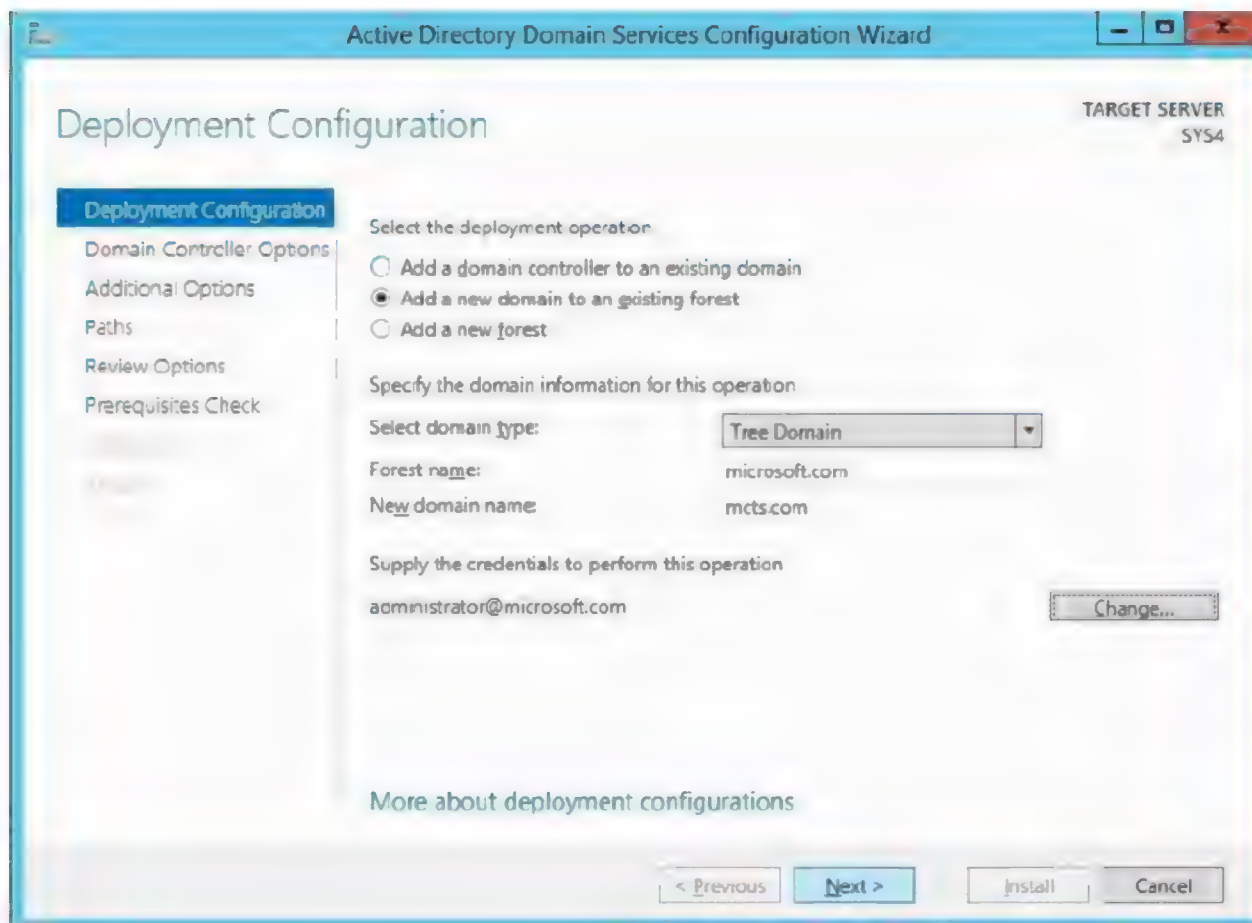


12. Click **Promote this server to a domain controller**.





13. In Deployment Configuration wizard, select **Add a new domain to an existing forest**, select domain type **Tree Domain**, enter the Forest name (Ex:MICROSOFT.COM) and New domain name (Ex: MCTS.COM), and click **Change**.

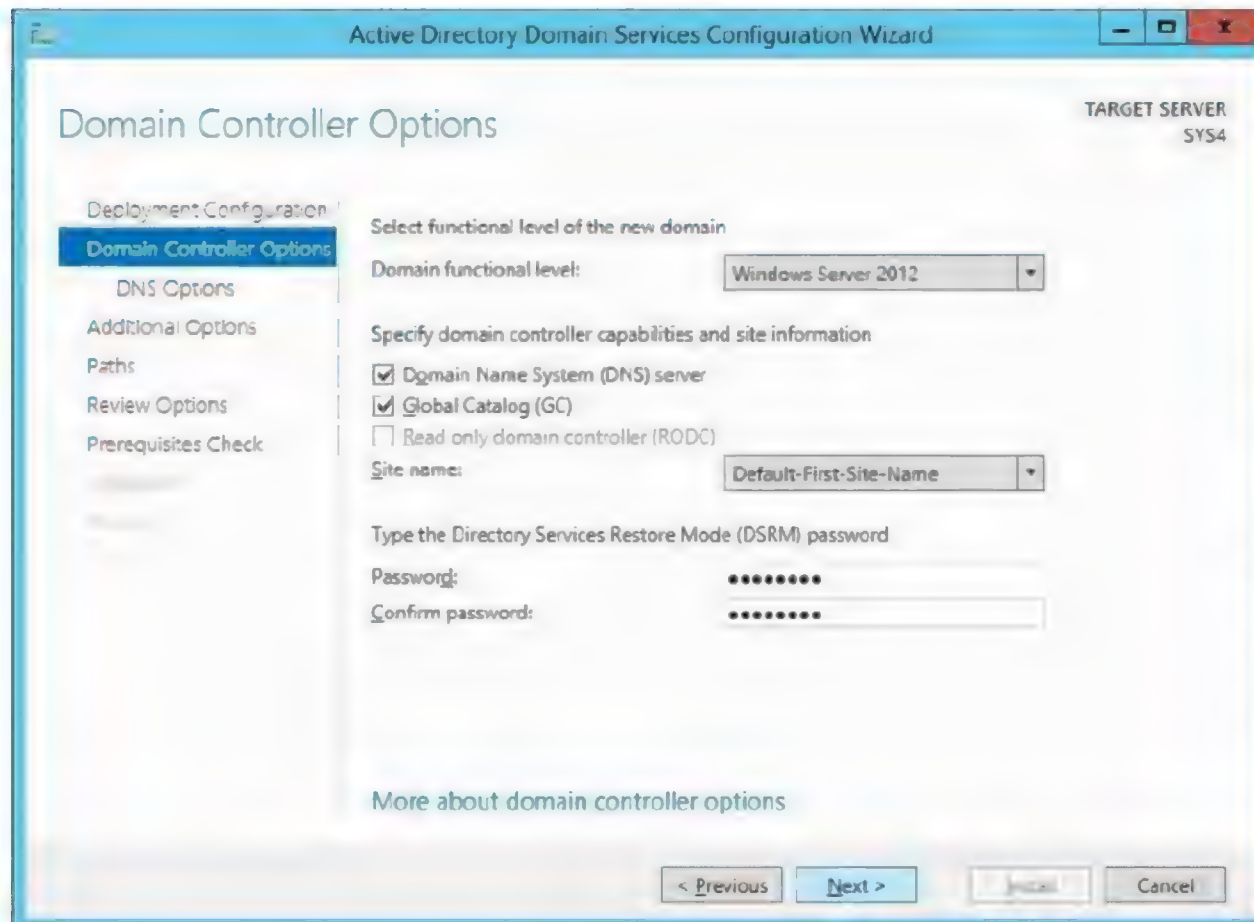


14. Enter User Name: Administrator@microsoft.com and Password, click **OK**.

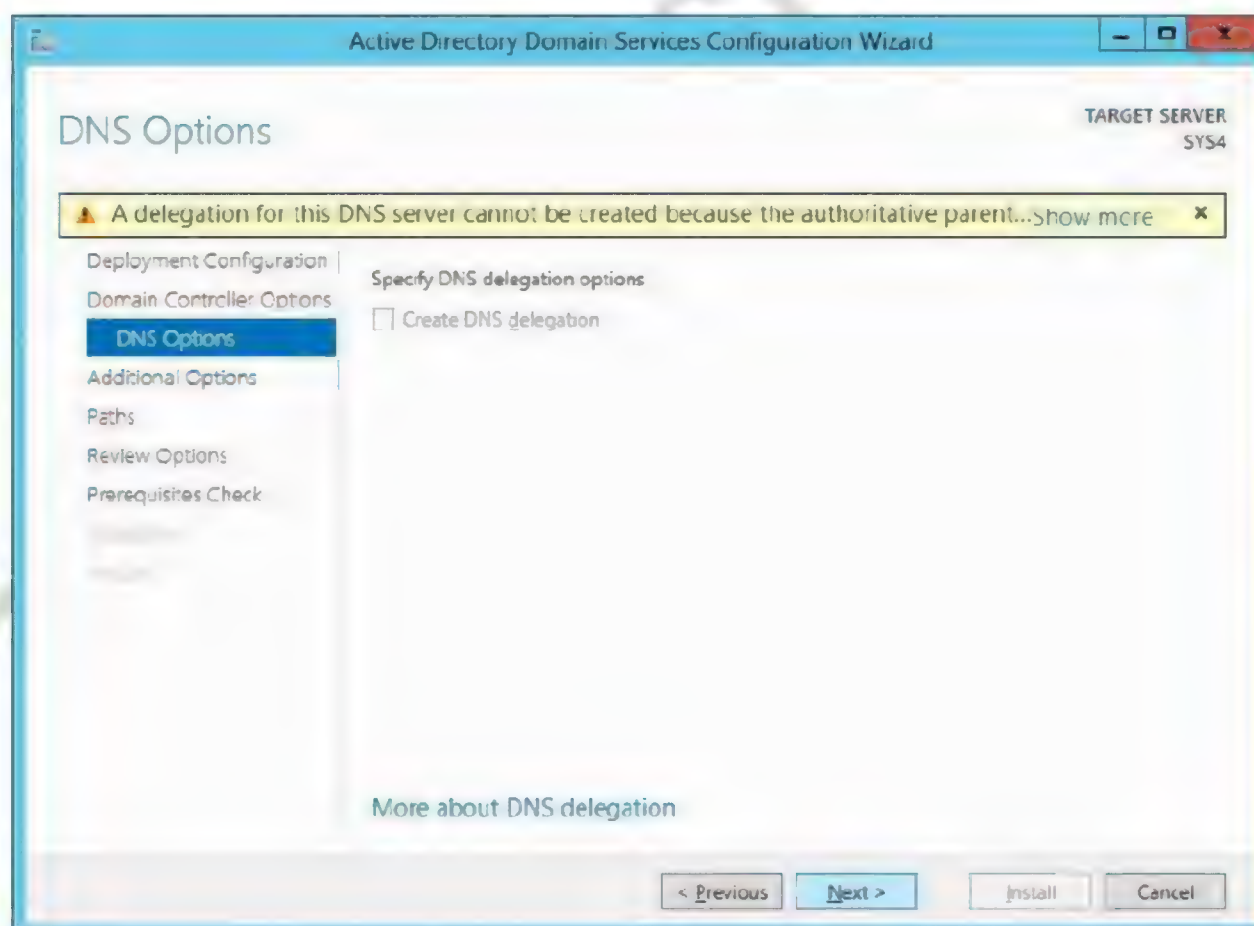


15. Click **Next**.

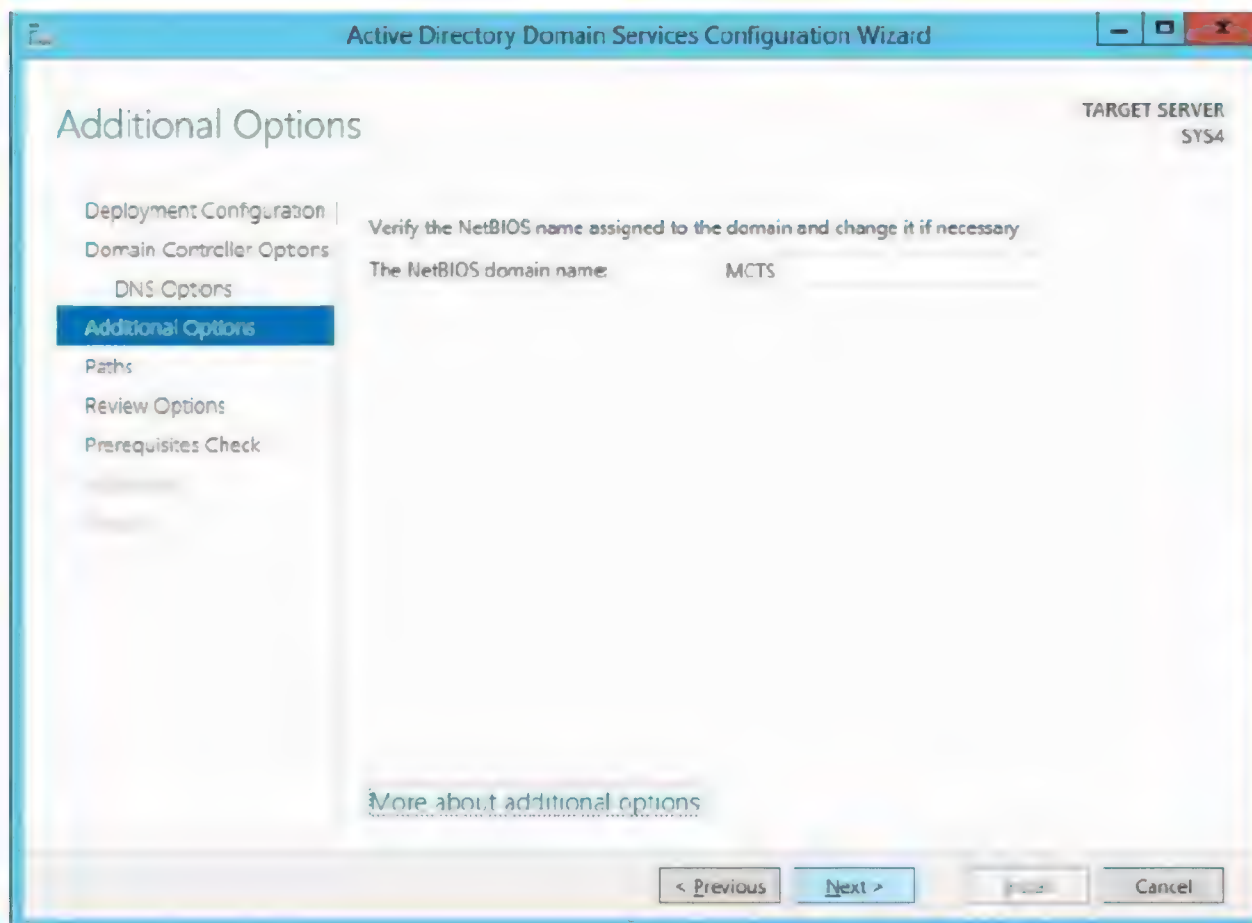
16. In Domain Controller Options, review the default settings, and type the Directory Services Restore Mode **Password** and **Confirm password** and click **Next**.



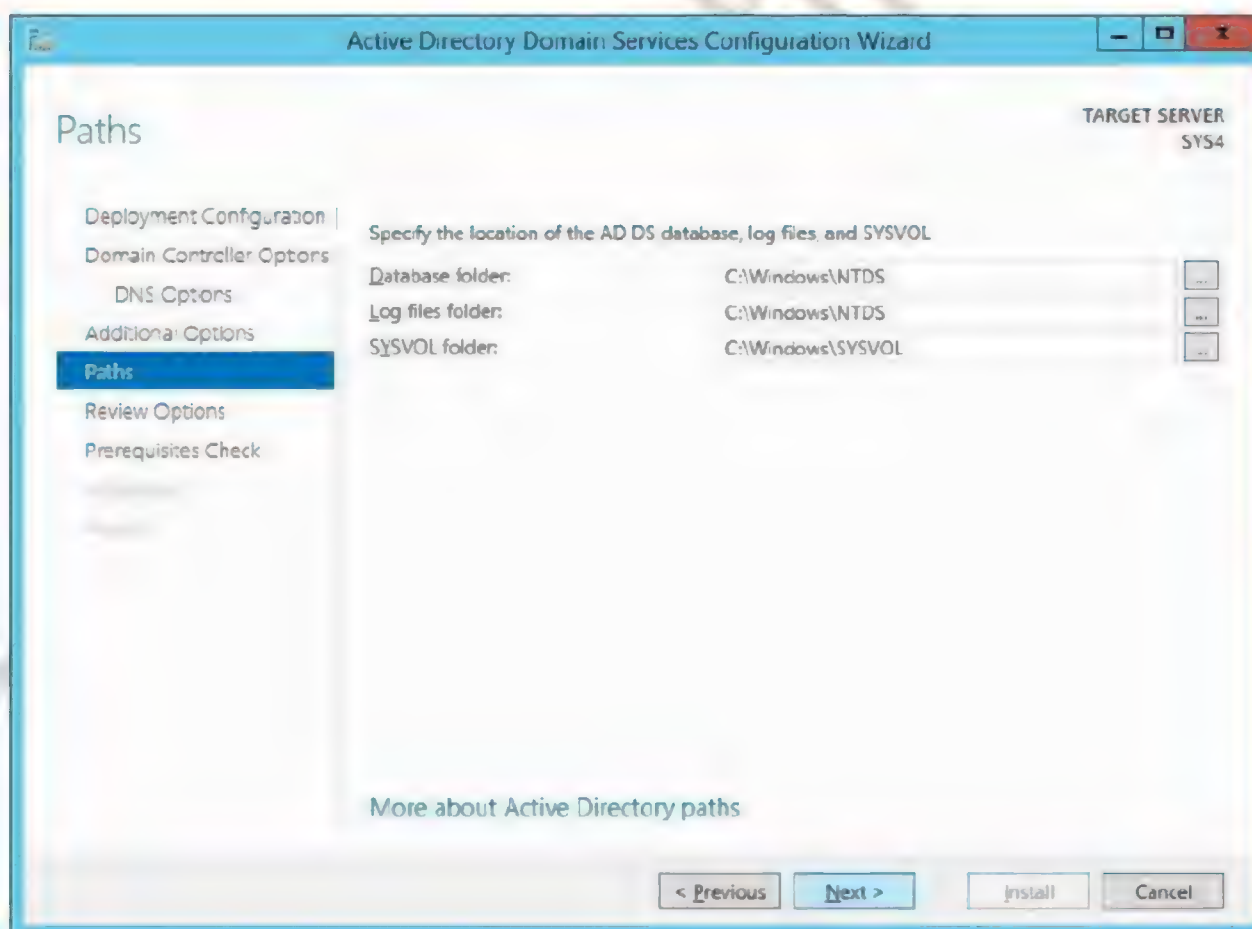
17. On DNS Options page, click **Next**.



18. In Additional Options Page, Review the NetBIOS domain name (**MCTS**) click **Next**.

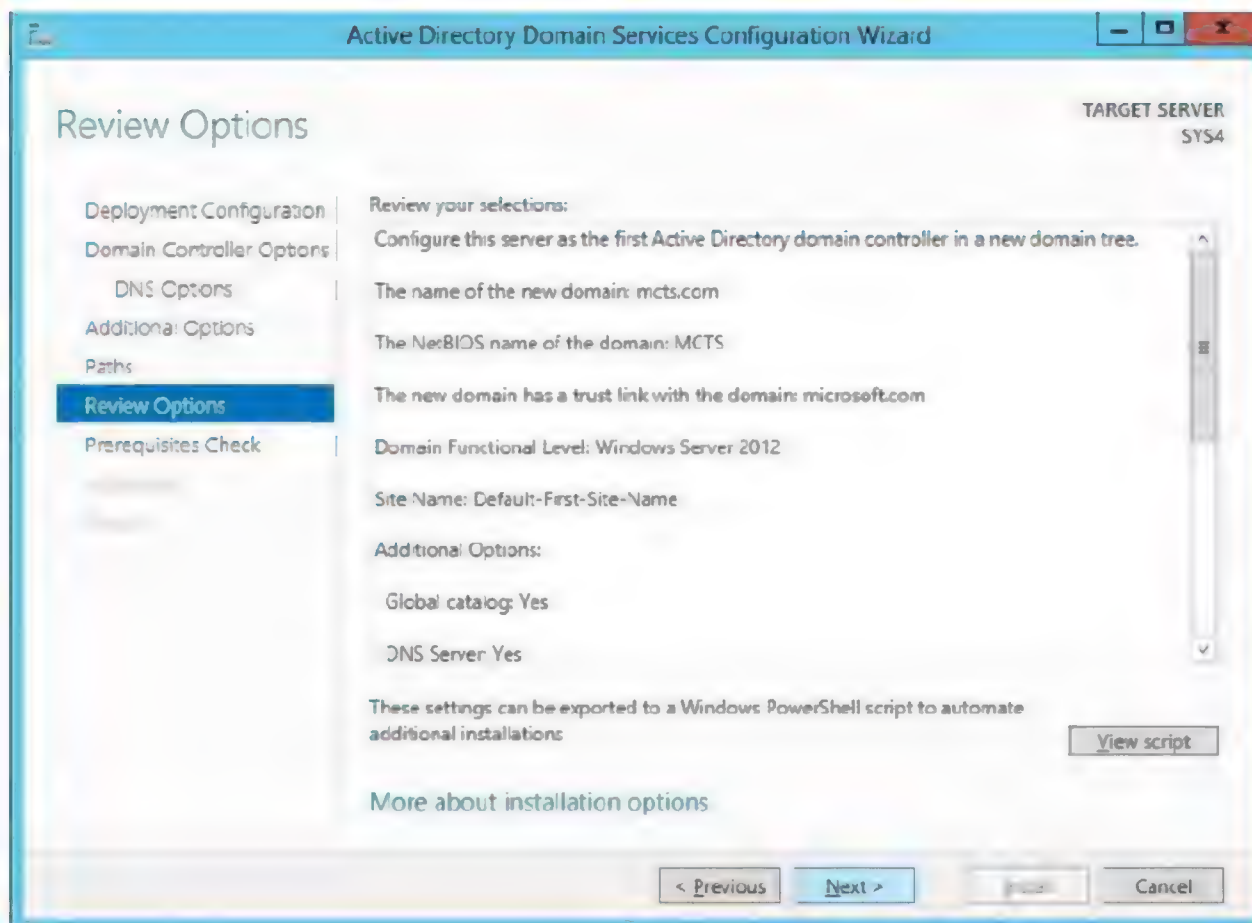


19. Verify the location of the AD DS database, log files, and SYSVOL, click **Next**.

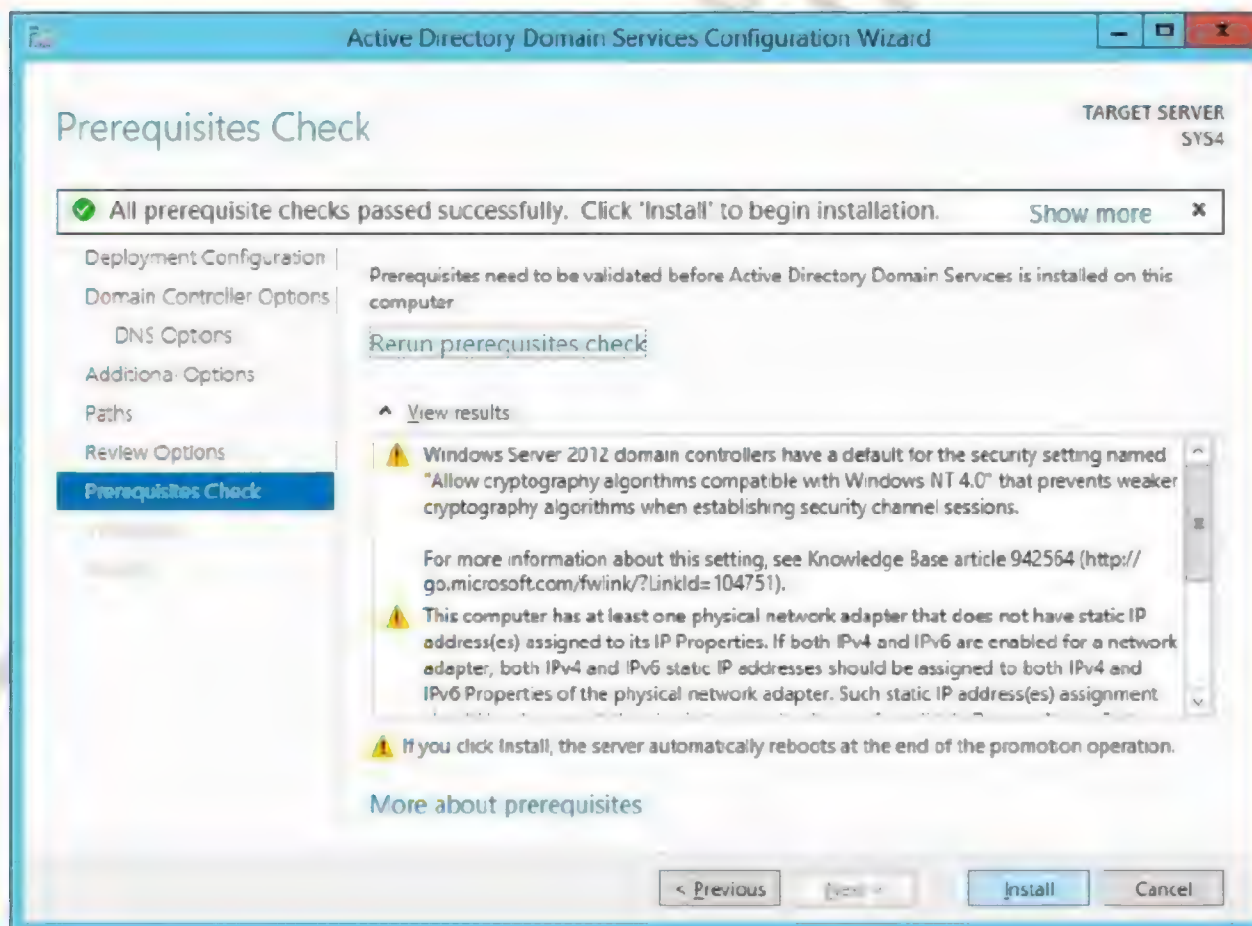




20. Review the Summary and click **Next**.



21. Click **Install** to begin installation.



22. After restarting the computer **Active directory** will be installed.

**Verification:**

1. Go to Server Manager, Local Server verify for Domain **MCTS.COM**
2. Go to **Active Directory Domains and Trusts** verify for parent and New Tree domain. Example: **MICROSOFT.COM** and **MCTS.COM**

## Lab – 29: Transfer Operations Masters

### Objective:

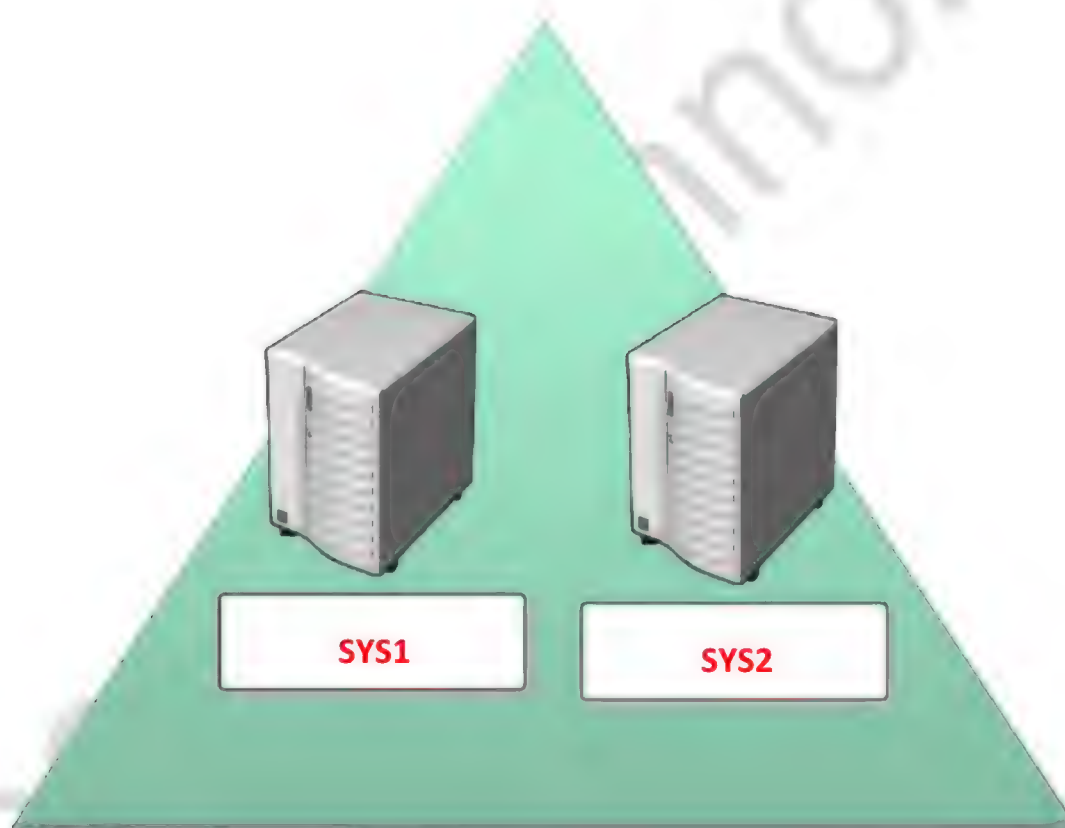
To transfer operations masters from primary to backup

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server Additional Domain controller.

### Topology:



**MICROSOFT.COM**

#### **SYS1**

##### **Domain Controller**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	-----

#### **SYS2**

##### **Additional Domain controller**

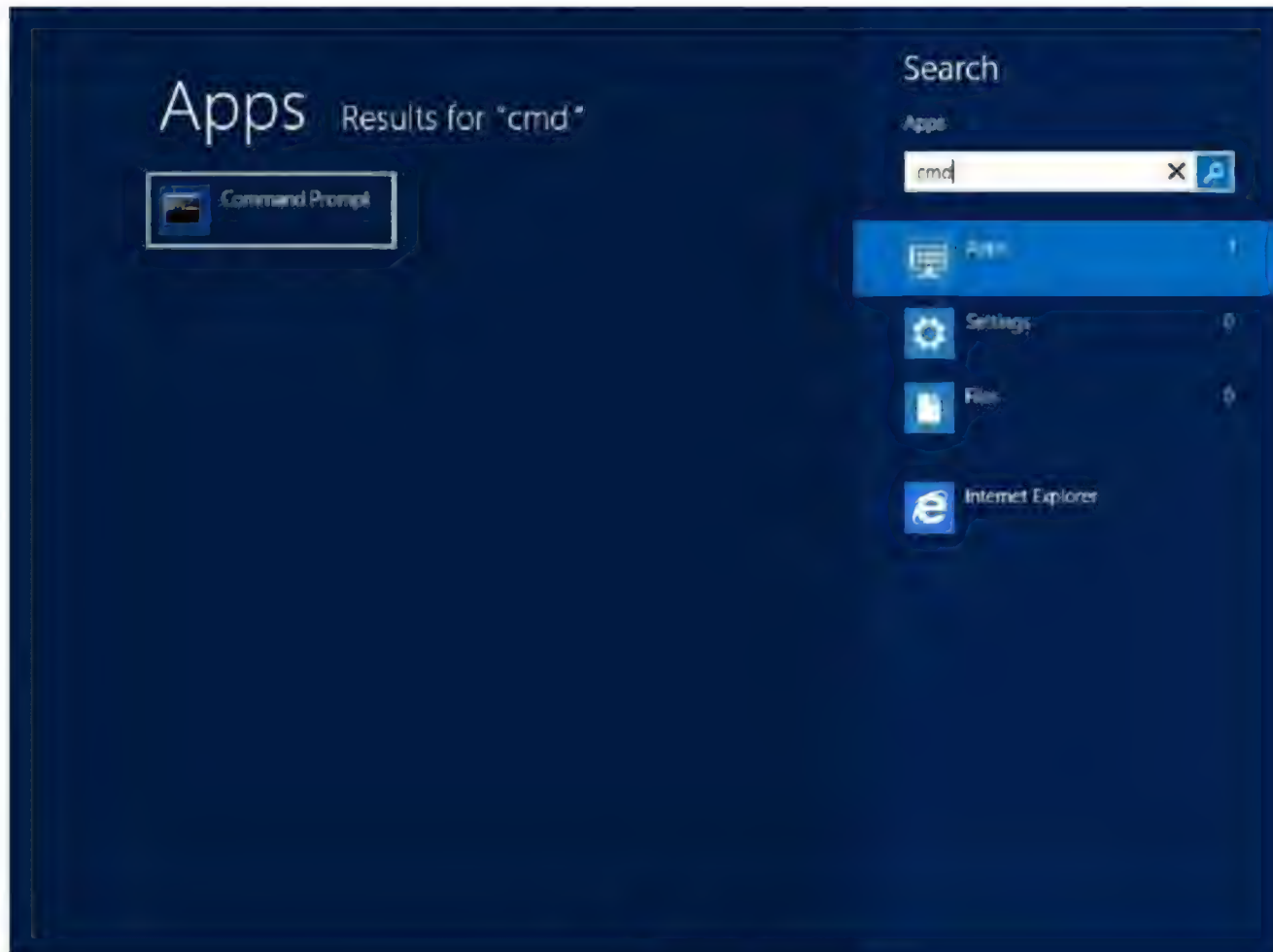
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2
Alternate DNS	10.0.0.1





**Steps:**

1. Log on to Domain Controller as Administrator
2. Go to Start, type cmd in Search Apps, and select **Command Prompt**



3. Type **Net accounts** and Verify for **Primary** in Computer role.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?:      Never
Minimum password age (days):                        1
Maximum password age (days):                        42
Minimum password length:                             7
Length of password history maintained:               24
Lockout threshold:                                   Never
Lockout duration (minutes):                          30
Lockout observation window (minutes):                30
Computer role:                                       PRIMARY
The command completed successfully.

C:\Users\Administrator>
```



4. Type **Ntdsutil** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?:      Never
Minimum password age (days):                        1
Maximum password age (days):                        42
Minimum password length:                             7
Length of password history maintained:               24
Lockout threshold:                                  Never
Lockout duration (minutes):                          30
Lockout observation window (minutes):                 30
Computer role:                                       PRIMARY
The command completed successfully.

C:\Users\Administrator>ntdsutil_
```

5. Type **Roles** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Microsoft windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?:      Never
Minimum password age (days):                        1
Maximum password age (days):                        42
Minimum password length:                             7
Length of password history maintained:               24
Lockout threshold:                                  Never
Lockout duration (minutes):                          30
Lockout observation window (minutes):                 30
Computer role:                                       PRIMARY
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
```



6. Type **Connections** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?:      Never
Minimum password age (days):                        1
Maximum password age (days):                        42
Minimum password length:                             7
Length of password history maintained:               24
Lockout threshold:                                   Never
Lockout duration (minutes):                          30
Lockout observation window (minutes):                 30
Computer role:                                       PRIMARY
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
```

7. Type **Connect to server SYS2 (ADC System name)** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?:      Never
Minimum password age (days):                        1
Maximum password age (days):                        42
Minimum password length:                             7
Length of password history maintained:               24
Lockout threshold:                                   Never
Lockout duration (minutes):                          30
Lockout observation window (minutes):                 30
Computer role:                                       PRIMARY
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
server connections: connect to server sys2
```



8. Type: **Quit**

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: PRIMARY
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
server connections: connect to server sys2
Binding to sys2 ...
Connected to sys2 using credentials of locally logged on user.
server connections: quit_
```

9. Type **Help** (or) **?**, to see the available syntax.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
server connections: connect to server sys2
Binding to sys2 ...
Connected to sys2 using credentials of locally logged on user.
server connections: quit
fsmo maintenance: ?_
```

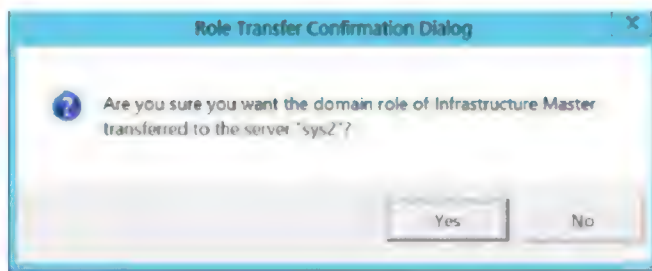
10. Type **Transfer infrastructure master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: ?
? - Show this help information
Connections - Connect to a specific AD DC/LDS instance
Help - Show this help information
Quit - Return to the prior menu
Seize infrastructure master - Overwrite infrastructure role on connected server
Seize naming master - Overwrite Naming Master role on connected server
Seize PDC - Overwrite PDC role on connected server
Seize RID master - Overwrite RID role on connected server
Seize schema master - Overwrite schema role on connected server
Select operation target - Select sites, servers, domains, roles and naming contexts
Transfer infrastructure master - Make connected server the infrastructure master
Transfer naming master - Make connected server the naming master
Transfer PDC - Make connected server the PDC
Transfer RID master - Make connected server the RID master
Transfer schema master - Make connected server the schema master

fsmo maintenance: Transfer infrastructure Master
```



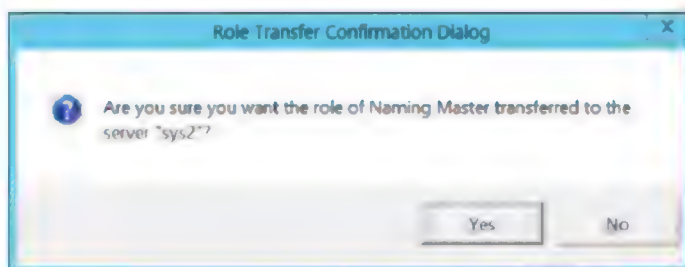
11. Click **YES**.



12. Type **Transfer naming master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Transfer schema master - Make connected server the schema master
fsmo maintenance: Transfer infrastructure Master
Server "sys2" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Transfer naming master
```

13. Click **YES**

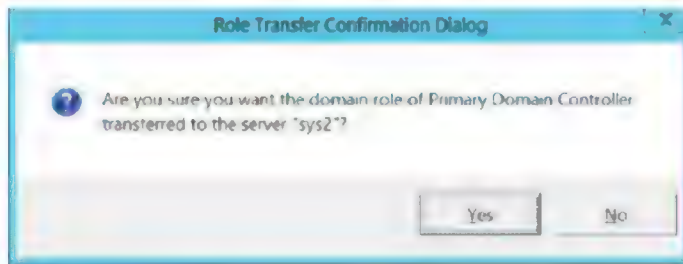


14. Type **Transfer PDC** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: Transfer naming master
Server "sys2" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Transfer PDC
```



15. Click **Yes**



16. Type **Transfer RID Master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: Transfer PDC
Server "sys2" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Transfer RID master
```

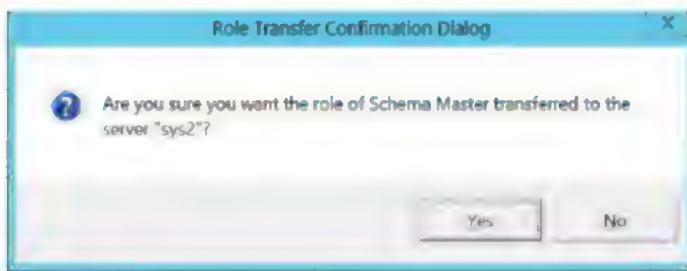
17. Click **YES**



18. Type **Transfer Schema Master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: Transfer RID master
Server "sys2" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Transfer schema master
```

19. Click **YES**



20. Type **Quit** and press **Enter**

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: Transfer schema master
Server "sys2" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: quit
```



21. Type **Quit** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: Transfer schema master
Server "sys2" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: quit
ntdsutil: quit_
```

**Verification:**

1. Type **Net accounts** and Press Enter
2. Computer role of **Domain Controller** will be converted to **Backup** and **Additional Domain Controller** will be converted to **Primary**.

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>
```

## Lab – 30: Seize Operations Masters

### Objective:

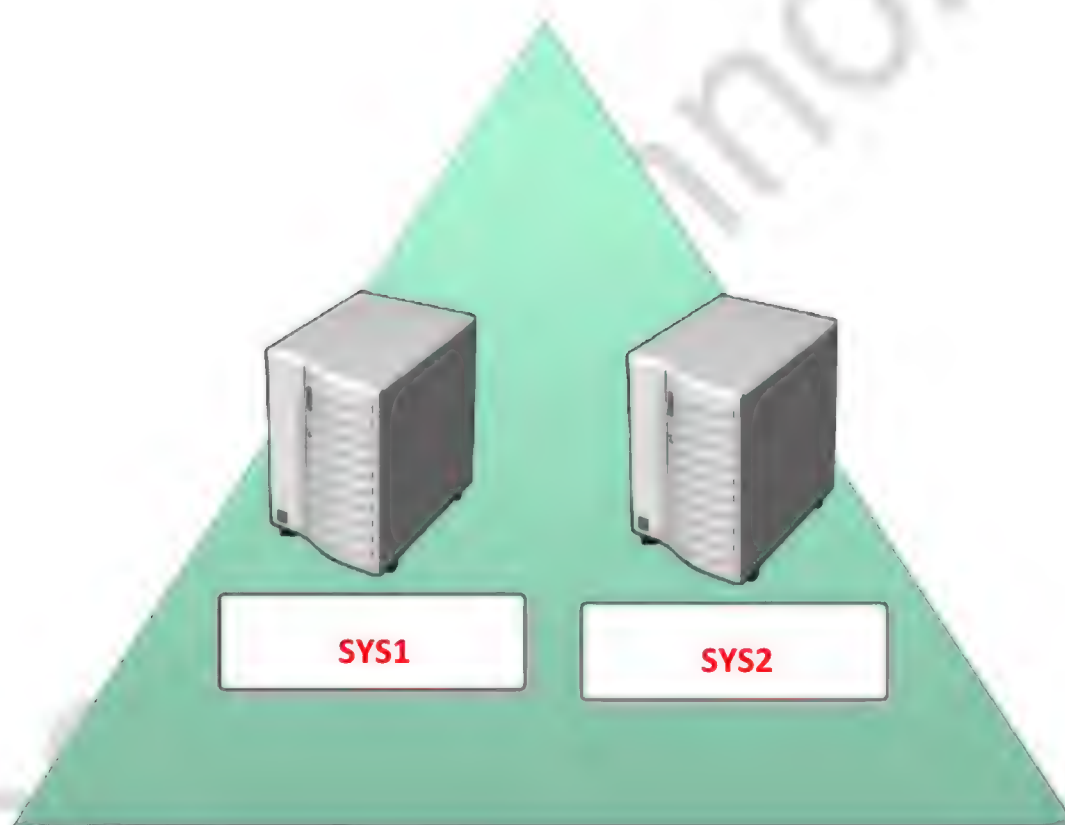
To seize operations masters in backup when primary is accidentally down

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server Additional Domain controller.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	-----

#### SYS2

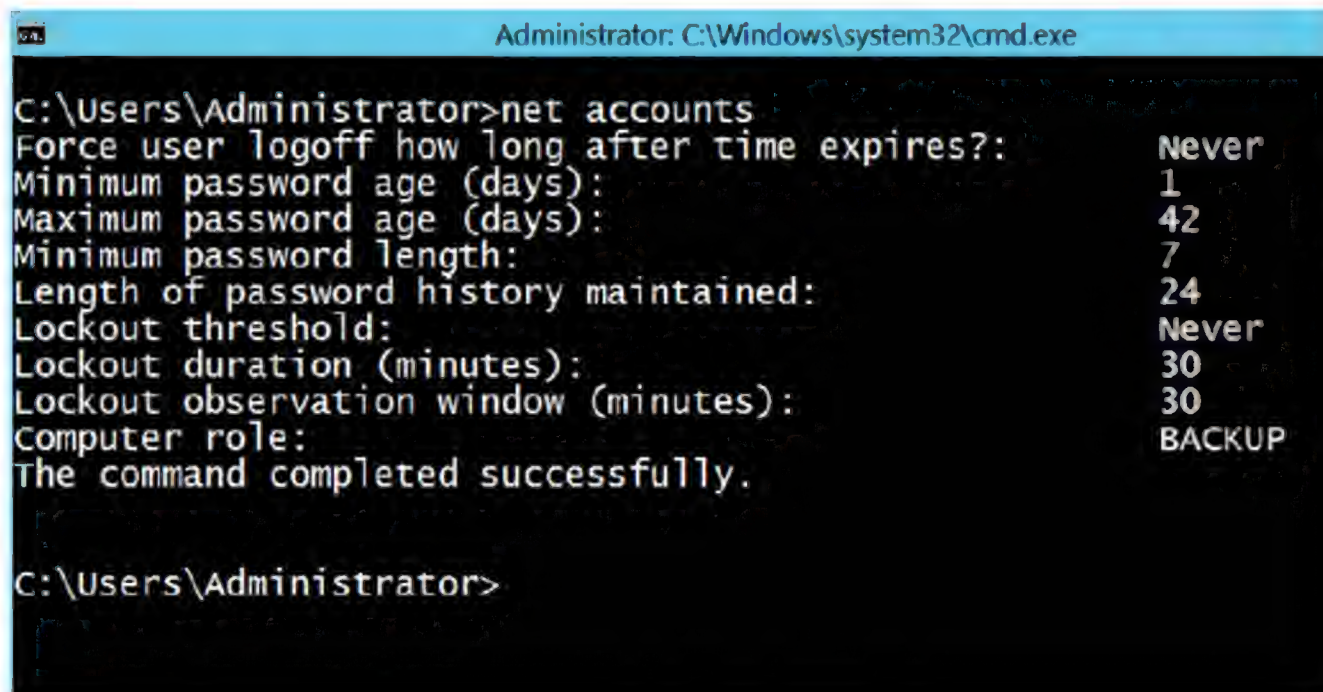
##### Additional Domain controller

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2
Alternate DNS	10.0.0.1



**Steps:**

1. Log on to **Additional Domain Controller** as **Administrator**
2. **Shutdown the Domain Controller**
3. Go to Start, type cmd in Search Apps, and select **Command Prompt**
4. Type **Net accounts** and Verify for **BACKUP** in Computer role.

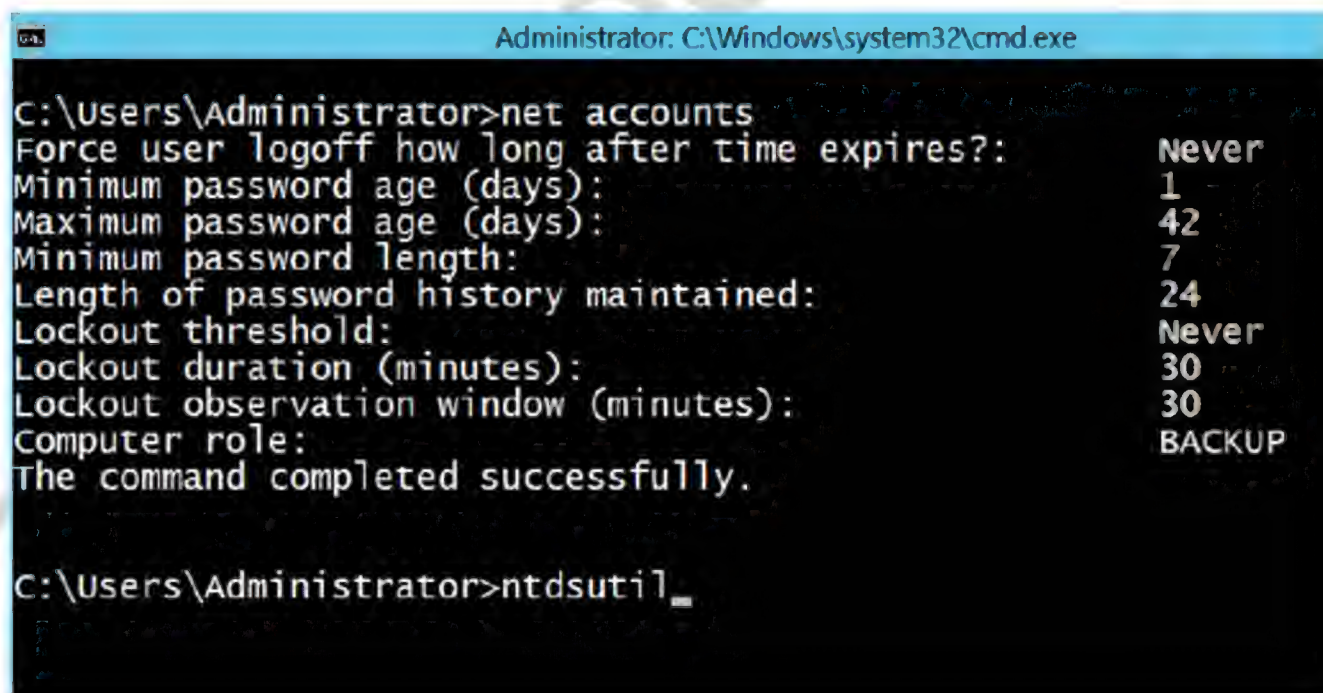


```
Administrator: C:\Windows\system32\cmd.exe

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>
```

5. Type **Ntdsutil** and Press Enter.



```
Administrator: C:\Windows\system32\cmd.exe

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>ntdsutil_
```



6. Type **Roles** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles_
```

7. Type **Connections** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
```

8. Type **Connect to server SYS1 (ADC System name)** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
server connections: connect to server sys1
```



9. Type: **Quit**

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: BACKUP
The command completed successfully.

C:\Users\Administrator>ntdsutil
ntdsutil: roles
fsmo maintenance: connections
server connections: connect to server sys1
Binding to sys1 ...
Connected to sys1 using credentials of locally logged on user.
server connections: quit
```

10. Type **Help(or)?** To view the available syntax.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil

fsmo maintenance: ?
? - Show this help information
Connections - Connect to a specific AD DC/LD
Help - Show this help information
Quit - Return to the prior menu
Seize infrastructure master - Overwrite infrastructure role
er
Seize naming master - Overwrite Naming Master role o
r
Seize PDC - Overwrite PDC role on connecte
Seize RID master - Overwrite RID role on connecte
Seize schema master - Overwrite schema role on conne
Select operation target - Select sites, servers, domains
naming contexts
Transfer infrastructure master - Make connected server the inf
r
Transfer naming master - Make connected server the nami
Transfer PDC - Make connected server the PDC
Transfer RID master - Make connected server the RID
Transfer schema master - Make connected server the sche

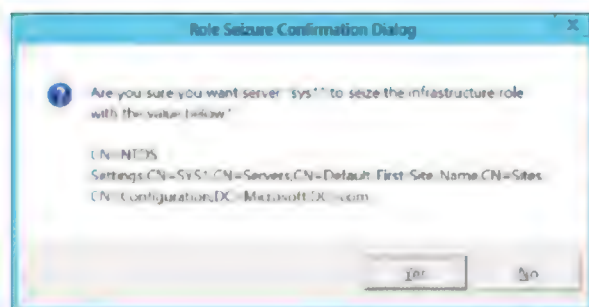
fsmo maintenance:
```



11. Type **Seize infrastructure master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: ?
? - Show this help information
Connections - Connect to a specific AD DC/LDAP server
help - Show this help information
Quit - Return to the prior menu
Seize infrastructure master - Overwrite infrastructure role
Seize naming master - Overwrite Naming Master role
Seize PDC - Overwrite PDC role on connected server
Seize RID master - Overwrite RID role on connected server
Seize schema master - Overwrite schema role on connected server
select operation target - Select sites, servers, domains, or naming contexts
Transfer infrastructure master - Make connected server the infrastructure master
Transfer naming master - Make connected server the naming master
Transfer PDC - Make connected server the PDC
Transfer RID master - Make connected server the RID master
Transfer schema master - Make connected server the schema master
fsmo maintenance: Seize infrastructure master_
```

12. Click **YES**.



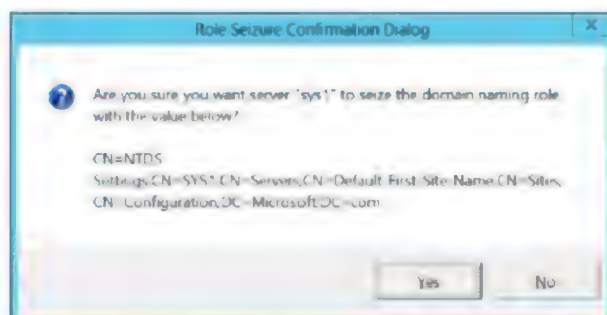


13. Type **Seize naming master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
fsmo maintenance: Seize infrastructure master
Attempting safe transfer of infrastructure FSMO before seizure.
ldap_modify_sw error 0x34(52 (Unavailable)).
Ldap extended error message is 000020AF: SvcErr: DSID-032103C7,
(AVAILABLE), data 8524

win32 error returned is 0x20af(The requested FSMO operation failed
FSMO holder could not be contacted.)
)
Depending on the error code this may indicate a connection,
ldap, or role transfer error.
Transfer of infrastructure FSMO failed, proceeding with seizure
Server "sys1" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Seize naming master_
```

14. Click **YES**

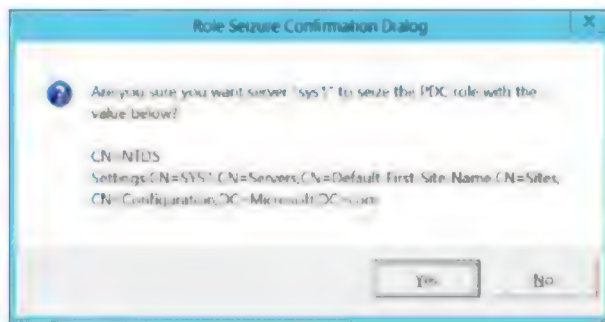


15. Type **Seize PDC** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
win32 error returned is 0x20af(The requested FSMO operation failed
FSMO holder could not be contacted.)
)
Depending on the error code this may indicate a connection,
ldap, or role transfer error.
Transfer of domain naming FSMO failed, proceeding with seizure
Server "sys1" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Seize PDC
```



16. Click **Yes**

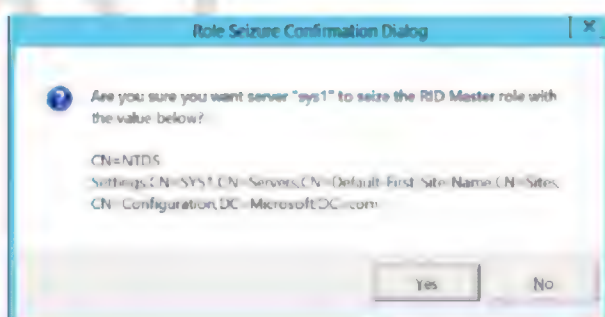


17. Type **Seize RID Master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Seize PDC
Attempting safe transfer of PDC FSMO before seizure.
ldap_modify_sw error 0x34(52 (Unavailable)).
Ldap extended error message is 000020AF: SvcErr: DSID-032105B1,
(AVAILABLE), data 8524

Win32 error returned is 0x20af(The requested FSMO operation failed because the
FSMO holder could not be contacted.)
)
Depending on the error code this may indicate a connection,
ldap, or role transfer error.
Transfer of PDC FSMO failed, proceeding with seizure ...
Server "sys1" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Seize RID master
```

18. Click **YES**

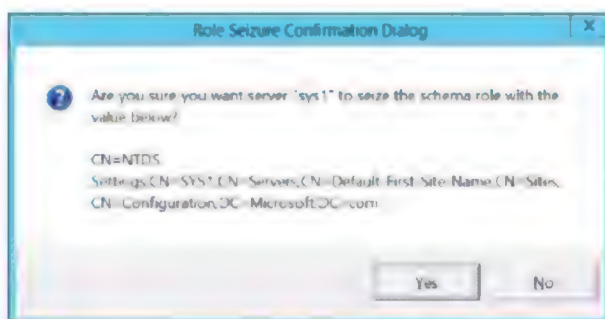




19. Type **Seize Schema Master** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
ldap, or role transfer error.
Transfer of RID FSMO failed, proceeding with seizure ...
Searching for highest rid pool in domain
Server "sys1" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS2,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: Seize Schema master_
```

20. Click **YES**



21. Type **Quit** and press Enter

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Depending on the error code this may indicate a connection,
ldap, or role transfer error.
Transfer of schema FSMO failed, proceeding with seizure ...
Server "sys1" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: quit_
```



22. Type **Quit** and Press Enter.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
Server "sys1" knows about 5 roles
Schema - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: quit
ntdsutil: quit_
```

**Verification:**

1. Type **Net accounts** and Press Enter
2. Computer role of **Additional Domain Controller will be converted to Primary.**

```
Administrator: C:\Windows\system32\cmd.exe
Naming Master - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
PDC - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
RID - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
Infrastructure - CN=NTDS Settings,CN=SYS1,CN=Servers,CN=Default-First-Site-Name,CN=Configuration,DC=Microsoft,DC=com
fsmo maintenance: quit
ntdsutil: quit

C:\Users\Administrator>net accounts
Force user logoff how long after time expires?: Never
Minimum password age (days): 1
Maximum password age (days): 42
Minimum password length: 7
Length of password history maintained: 24
Lockout threshold: Never
Lockout duration (minutes): 30
Lockout observation window (minutes): 30
Computer role: PRIMARY
The command completed successfully.

C:\Users\Administrator>
```

## Lab – 31: Applying Group Policy on Organizational Unit Level

### Objective:

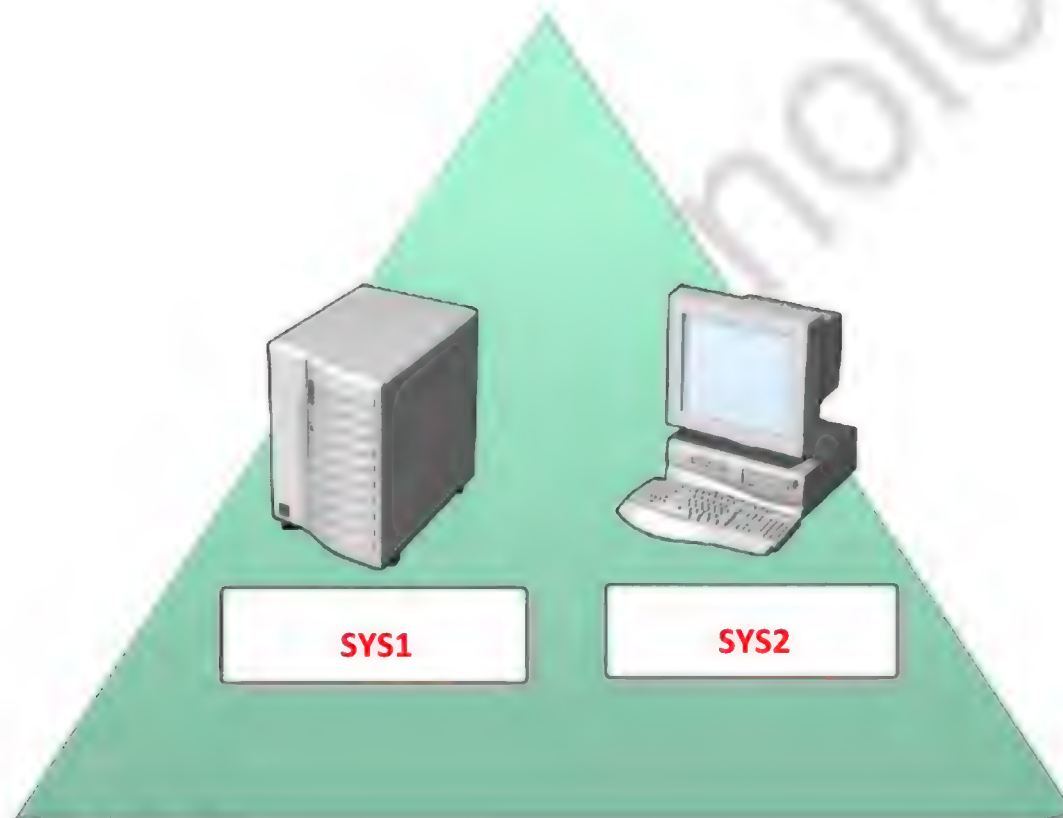
To apply group policies on a particular OU

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

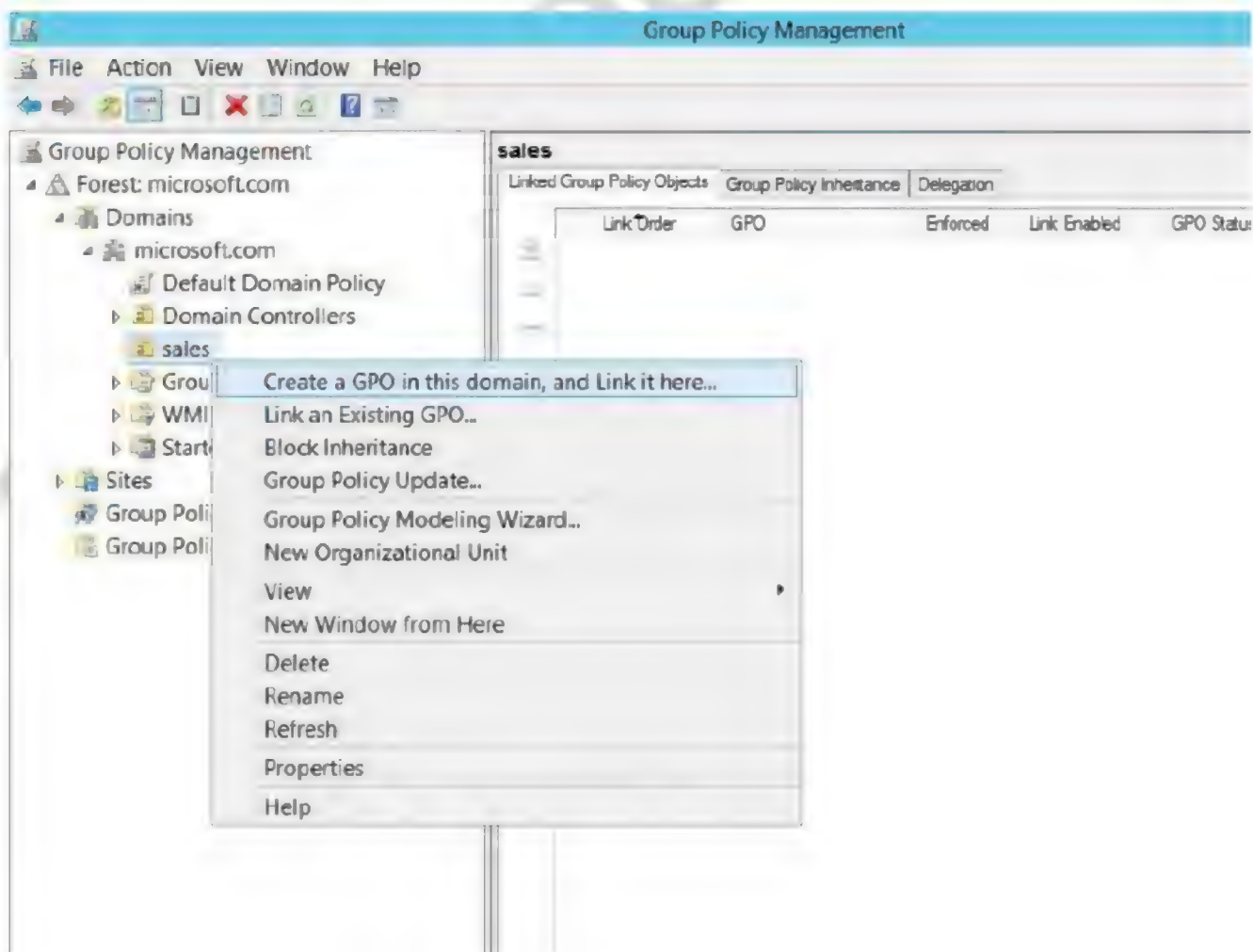


**Steps:**

1. Press Windows Key to go to Start, select **Group Policy Management**.

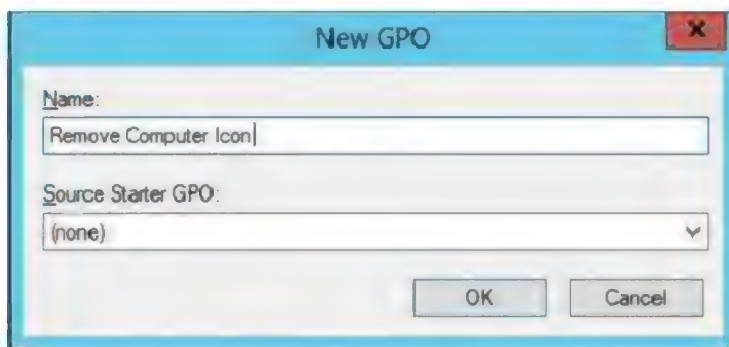


2. Right click OU (Sales) → Create a GPO in this domain and Link it here.

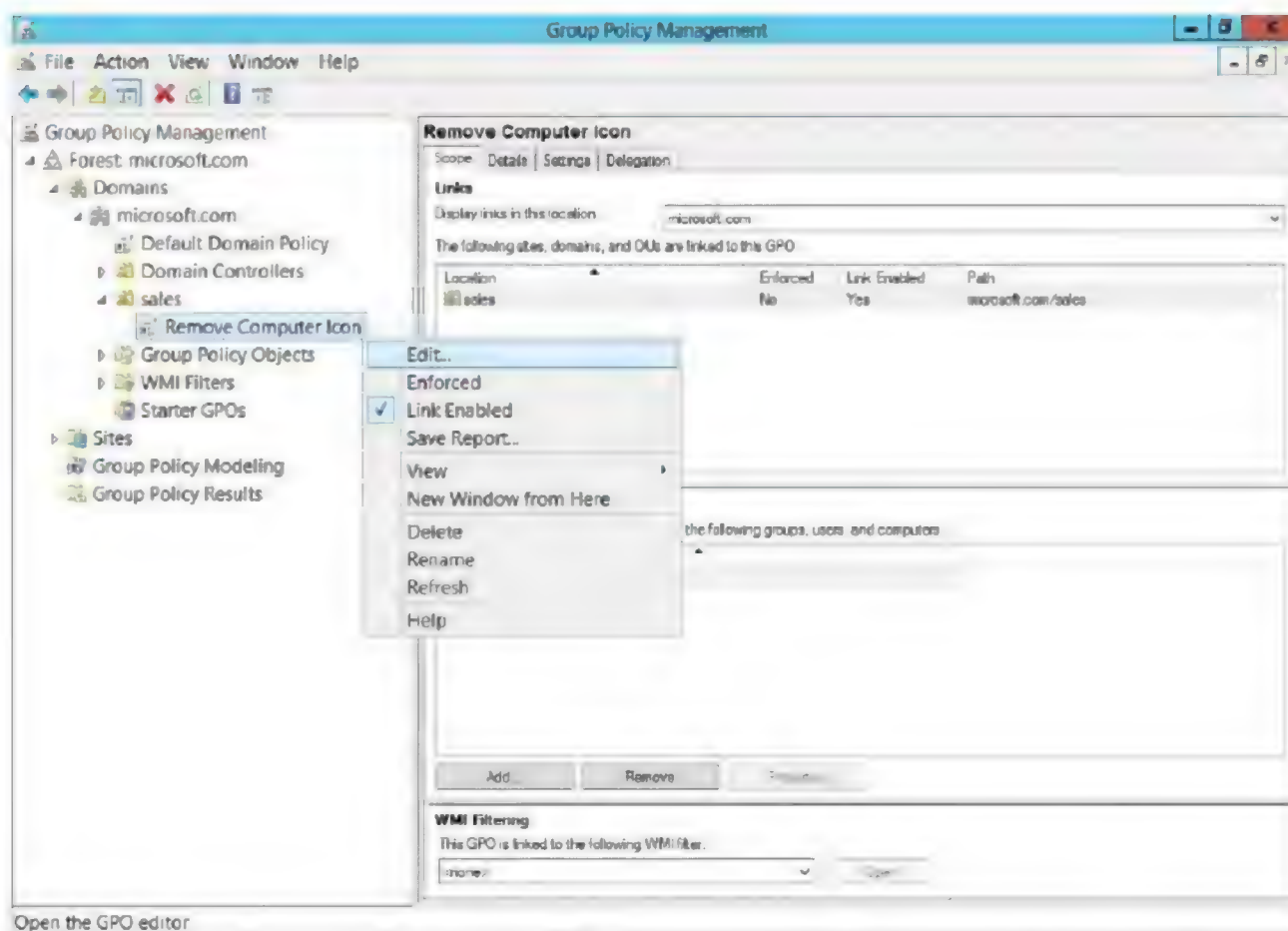




3. Enter any name to GPO Link (Ex: **Remove Computer Icon**) and click **OK**.

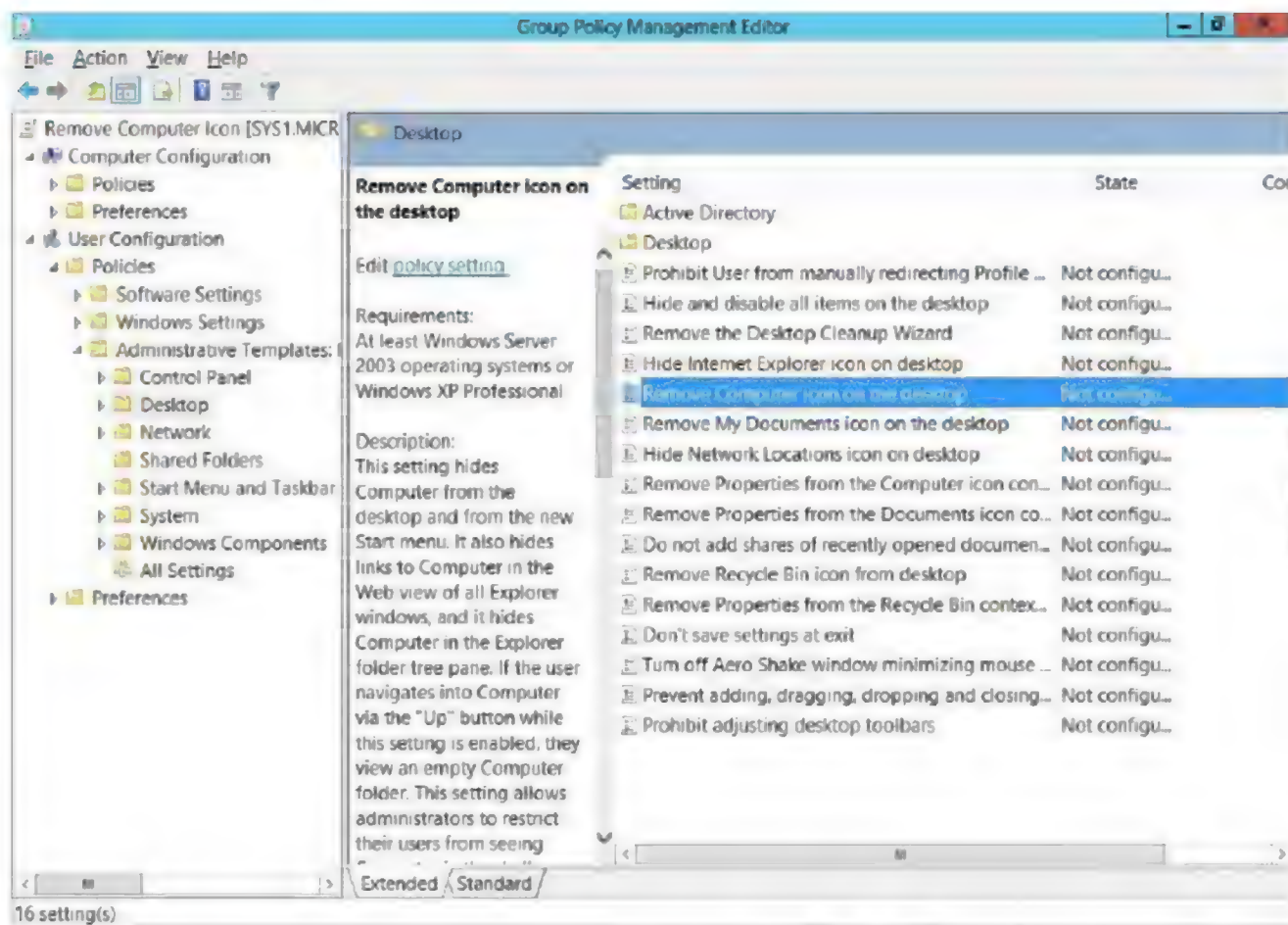


4. Right Click created GPO Link → **Edit**

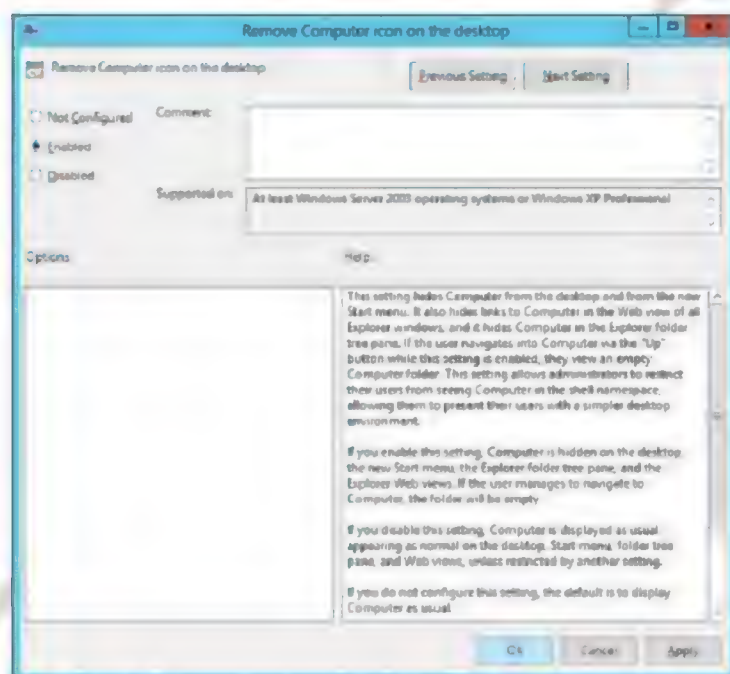


5. In Group Policy Management Editor Window, Go to **User Configuration → Policies → Administrative Templates → Desktop**.

6. Select a policy (**Remove Computer icon on the Desktop**) on right side of the screen, Right Click and select **Properties**.

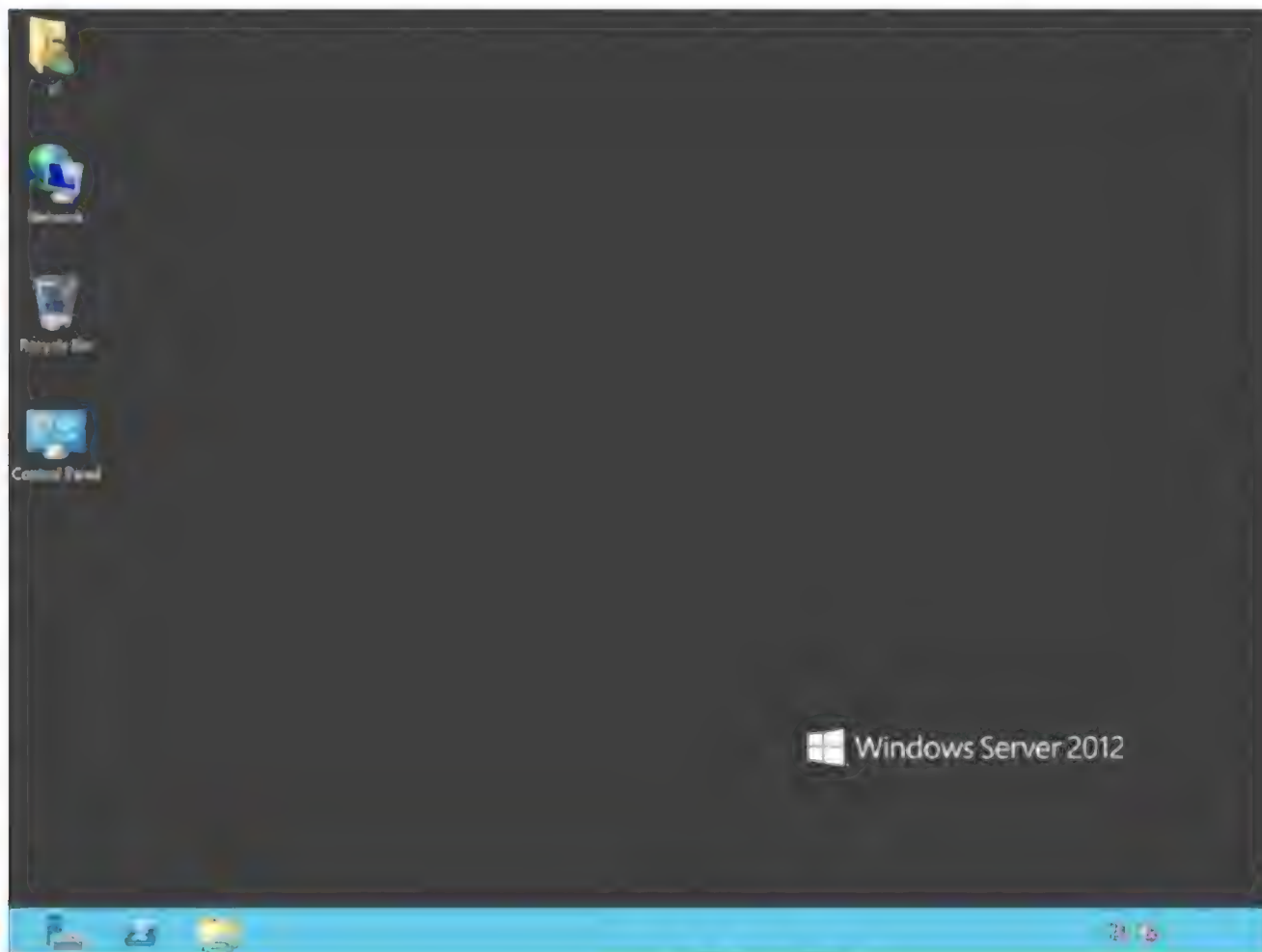


7. Select **Enabled** option and click **Apply** and **OK**.



**Verification:**

1. Logon to client system as sales OU user (s1) and verify the changes because of the policy.





## Lab – 32: Applying Group Policy on Domain Level

### Objective:

To apply policies which will affect the complete domain

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

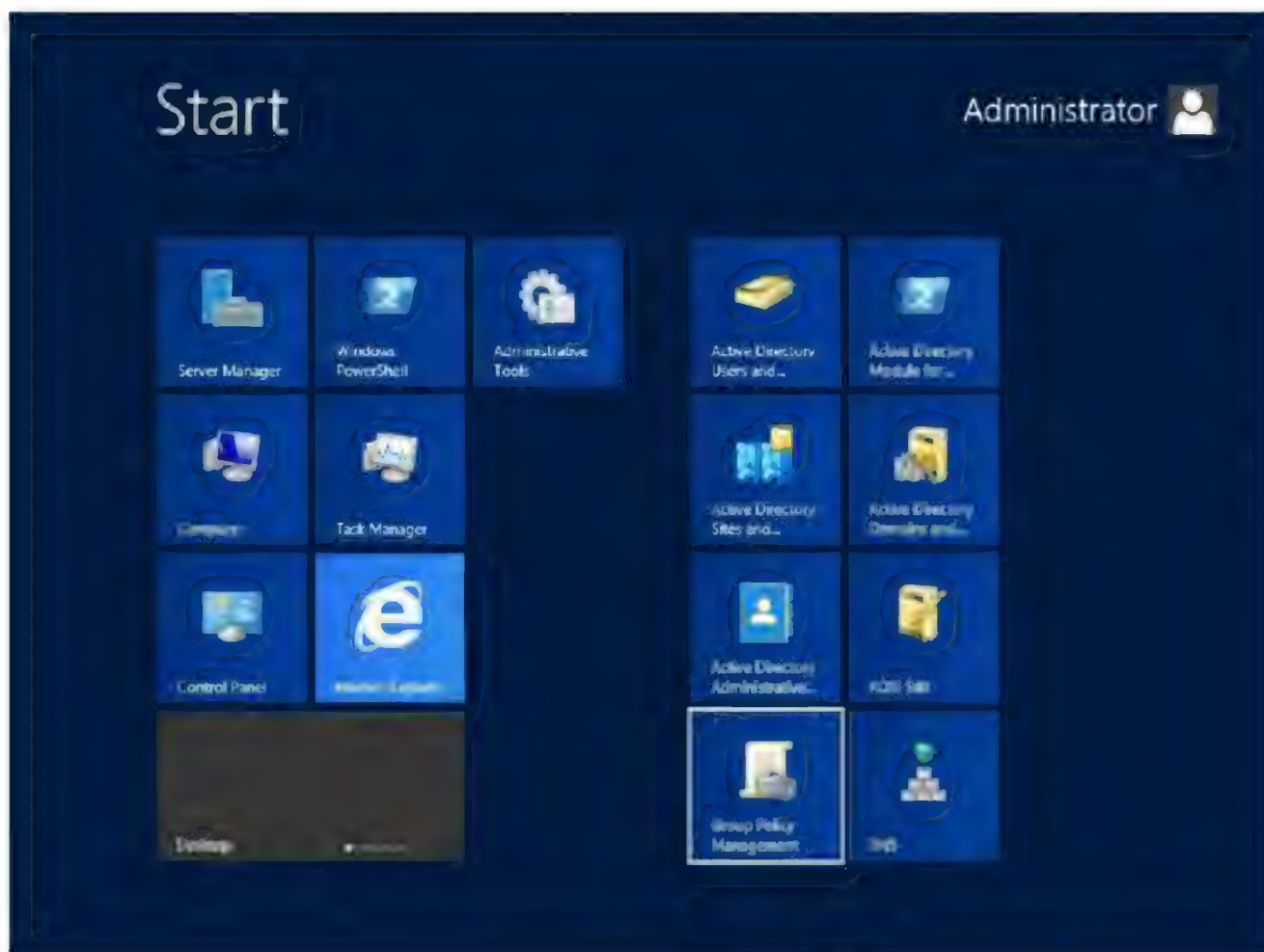
#### SYS2

##### Member Server / Client

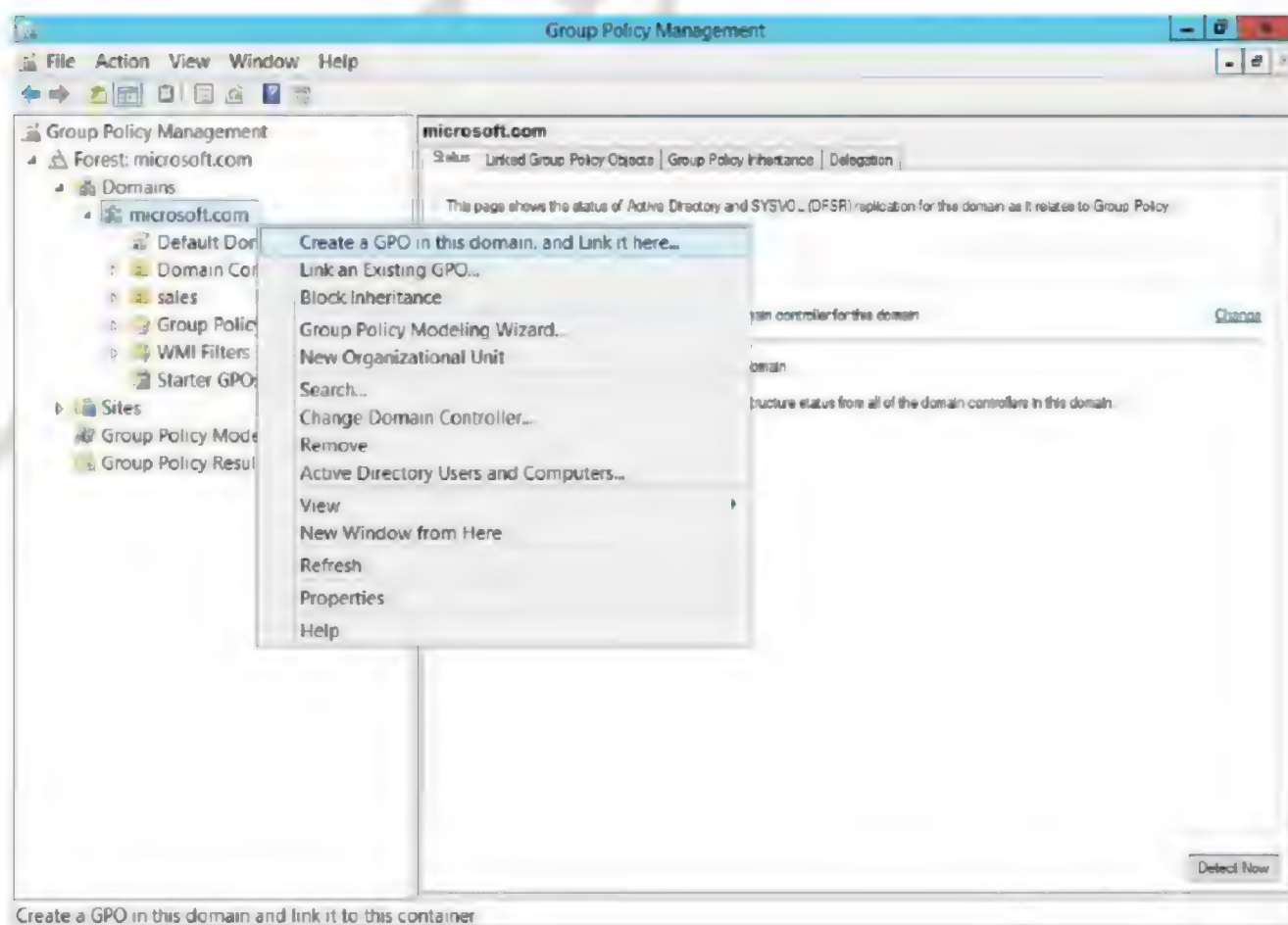
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Press Windows Key to go to Start, select **Group Policy Management**.



2. Right click Domain name (**MICROSOFT.COM**) and select **Create a GPO in this domain and Link it here.**

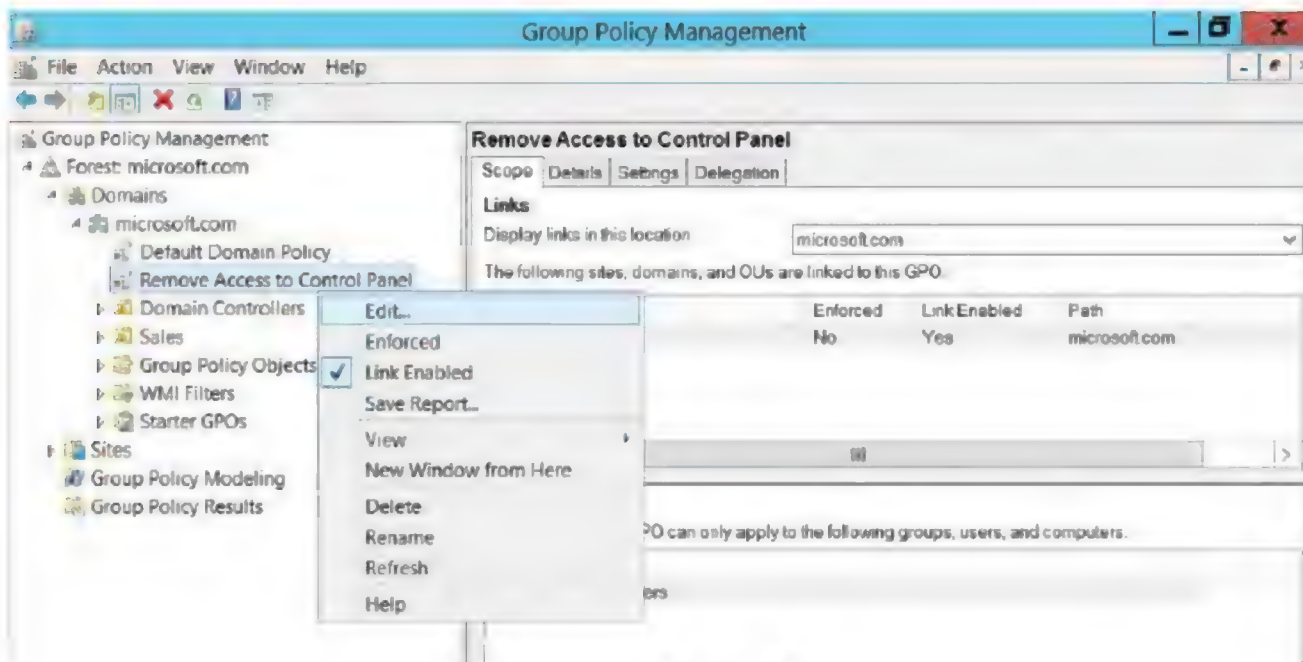




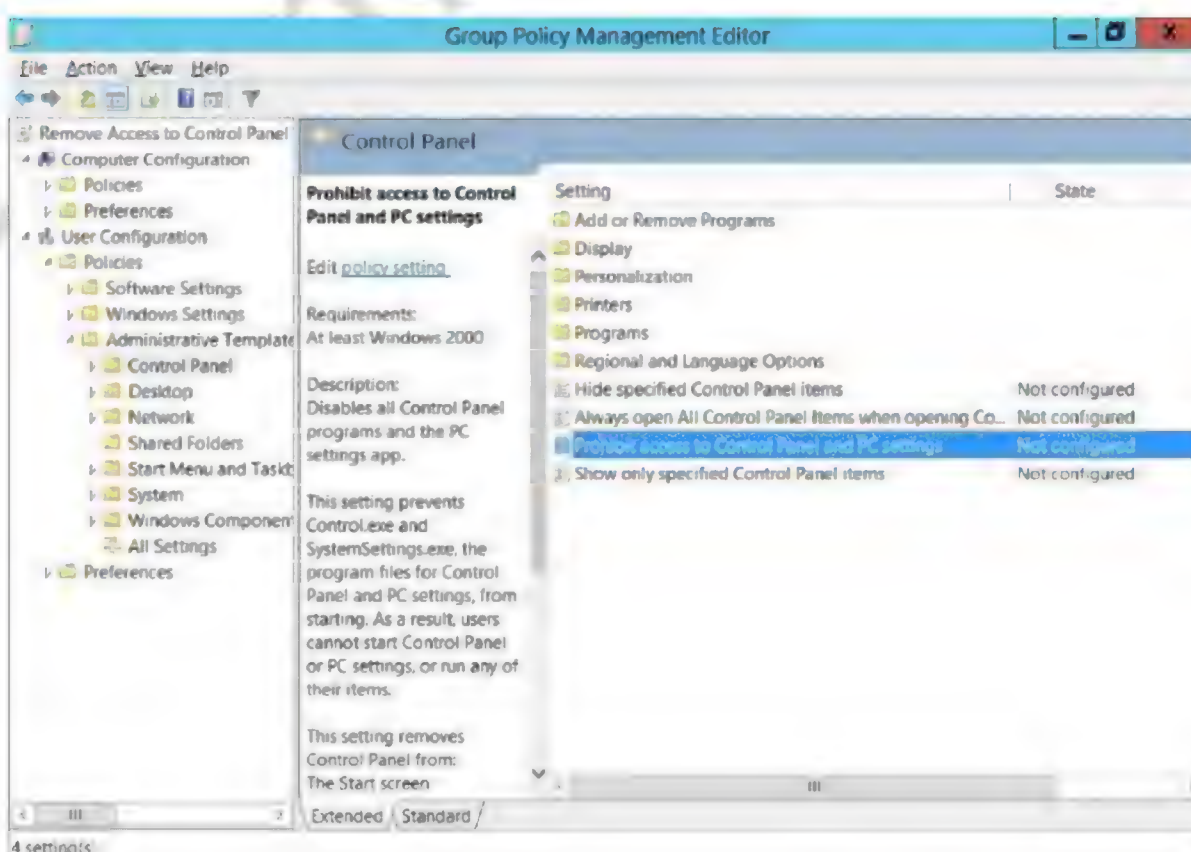
- Enter New GPO Link name Ex: **Remove Network Icon** and click **OK**.



- Select the Created GPO → Right Click Created GPO → Select **Edit**.

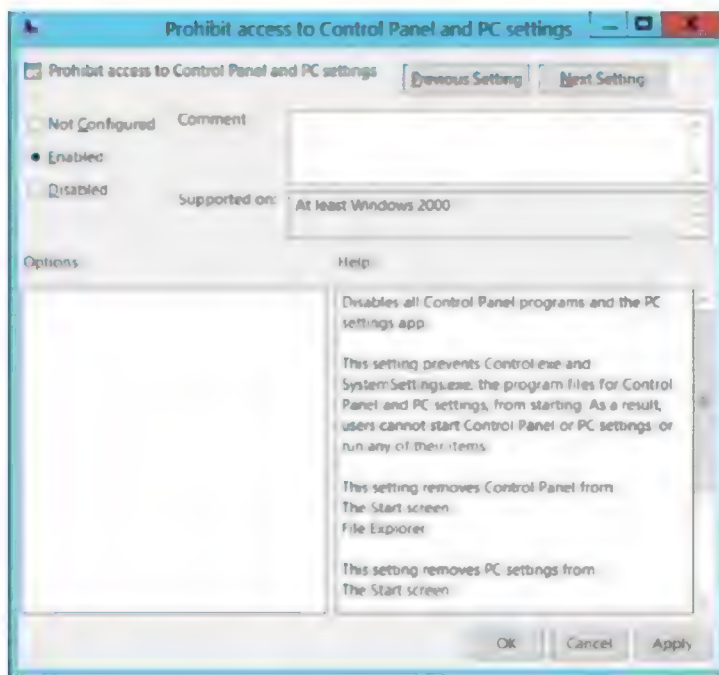


- In the Group Policy Management editor window, Go to **User Configuration → Policies → Administrative Templates → Control Panel**
- Select a policy (**Prohibit Access to Control Panel and PC Settings**) right side of the screen, Right Click and select **Properties**.



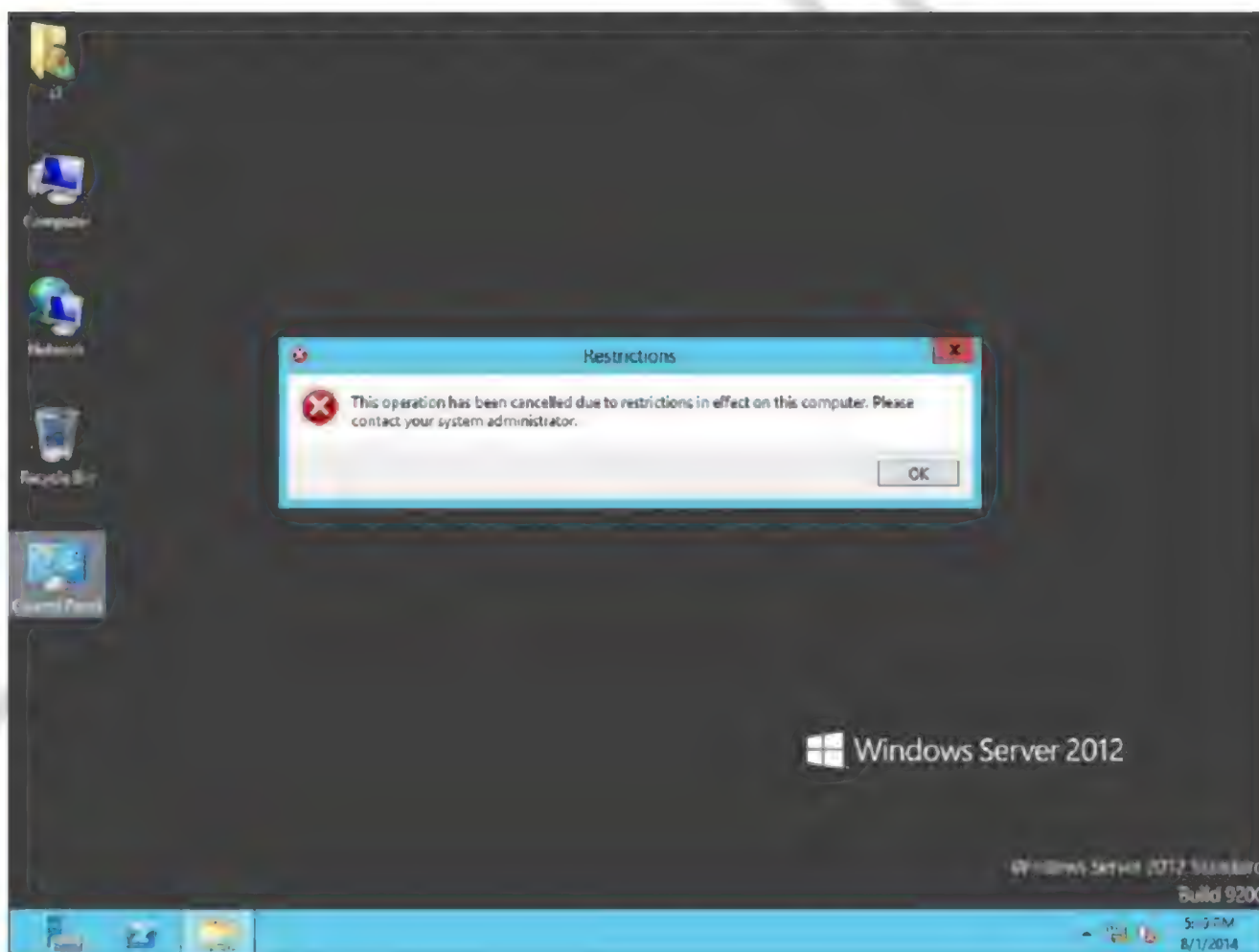


7. Select **Enabled** option and click **Apply** and **OK**



### Verification:

1. Login as User (**S1**) to **Client** or **Member Server** and try to access Control Panel.



## Lab – 33: Applying Group Policy on Site Level

### Objective:

To apply policies according to locations

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

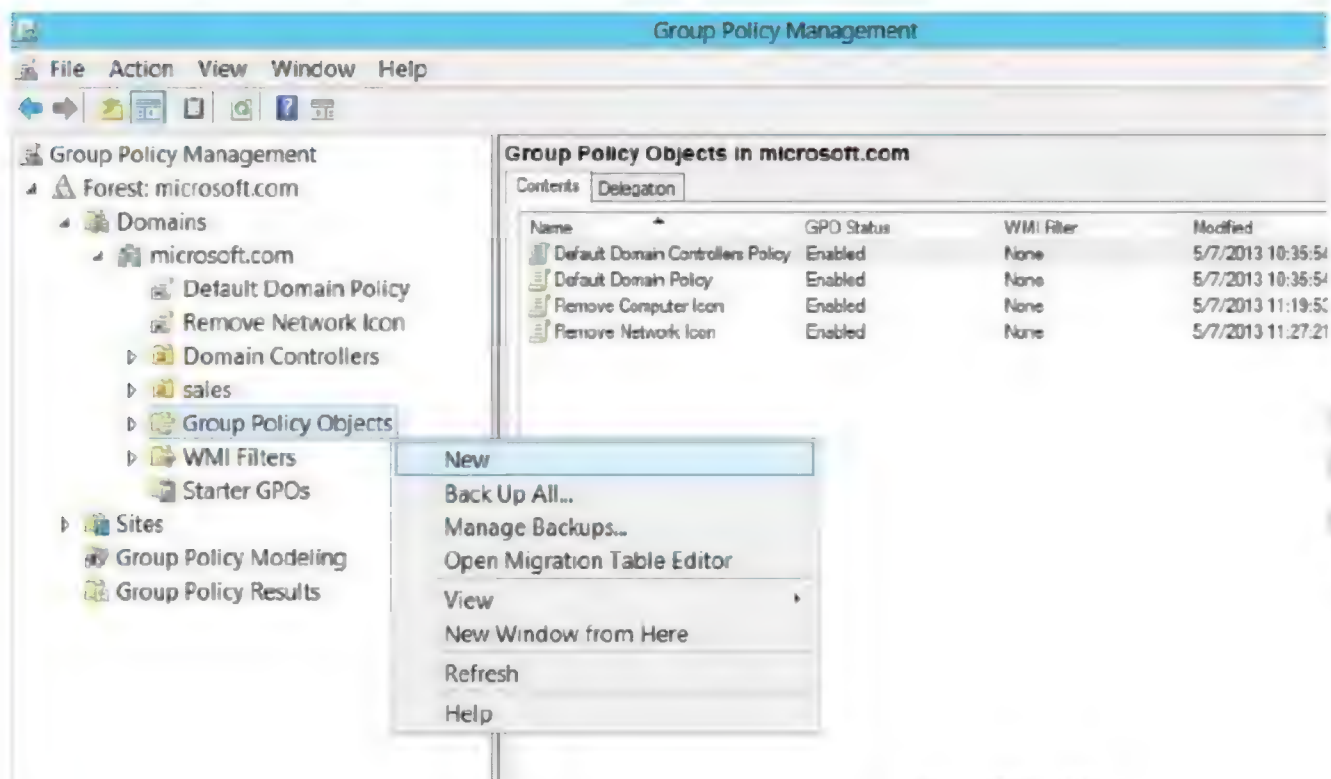
#### SYS2

##### Member Server / Client

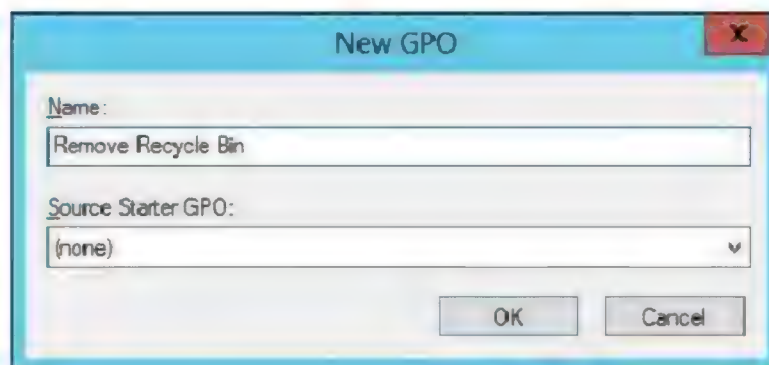
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to Start, **Group Policy Management** → Right click **Group Policy Objects** → Select **New**.

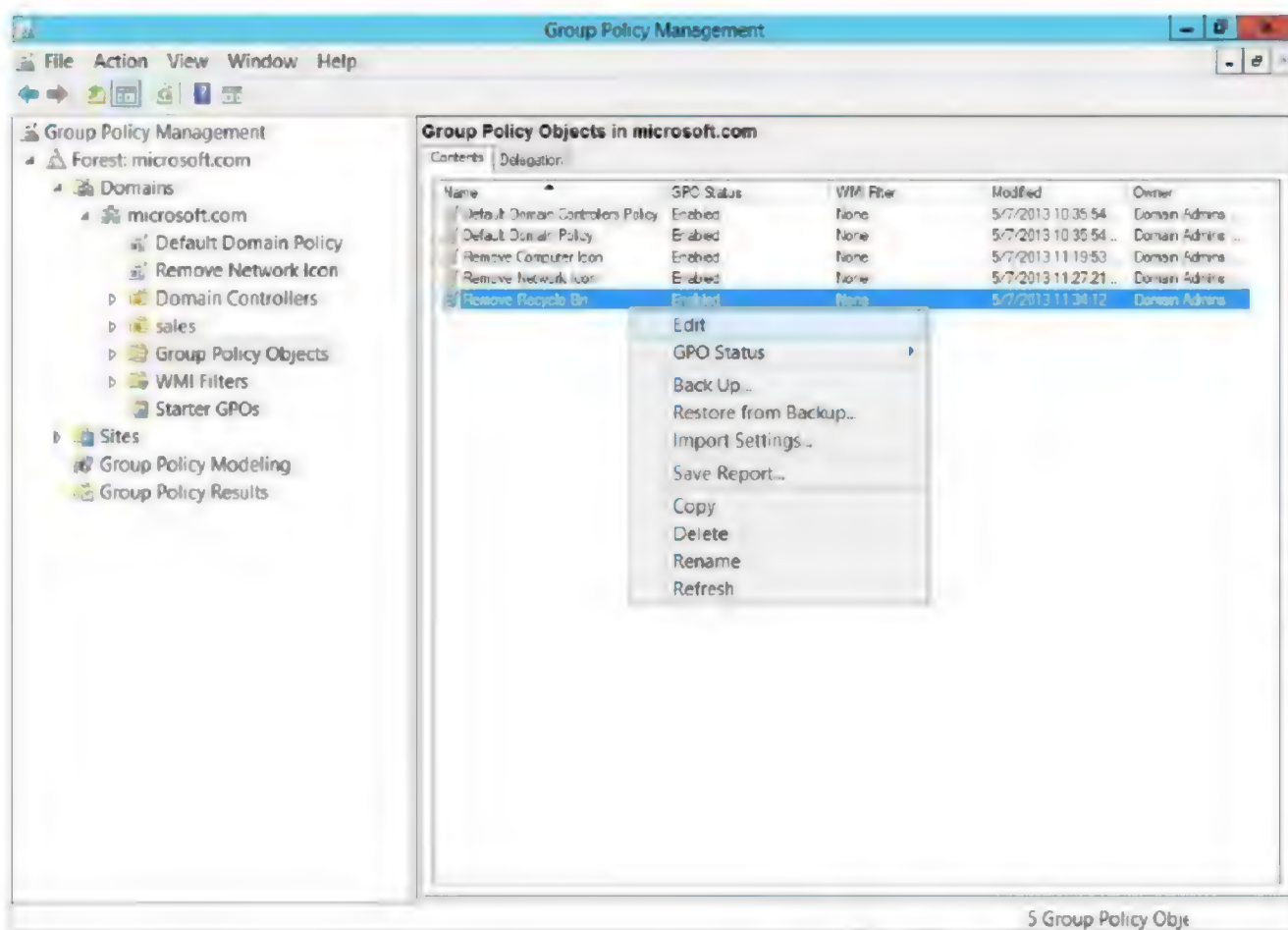


2. Enter New GPO Link name Ex: **Remove Recycle Bin** and click **OK**.

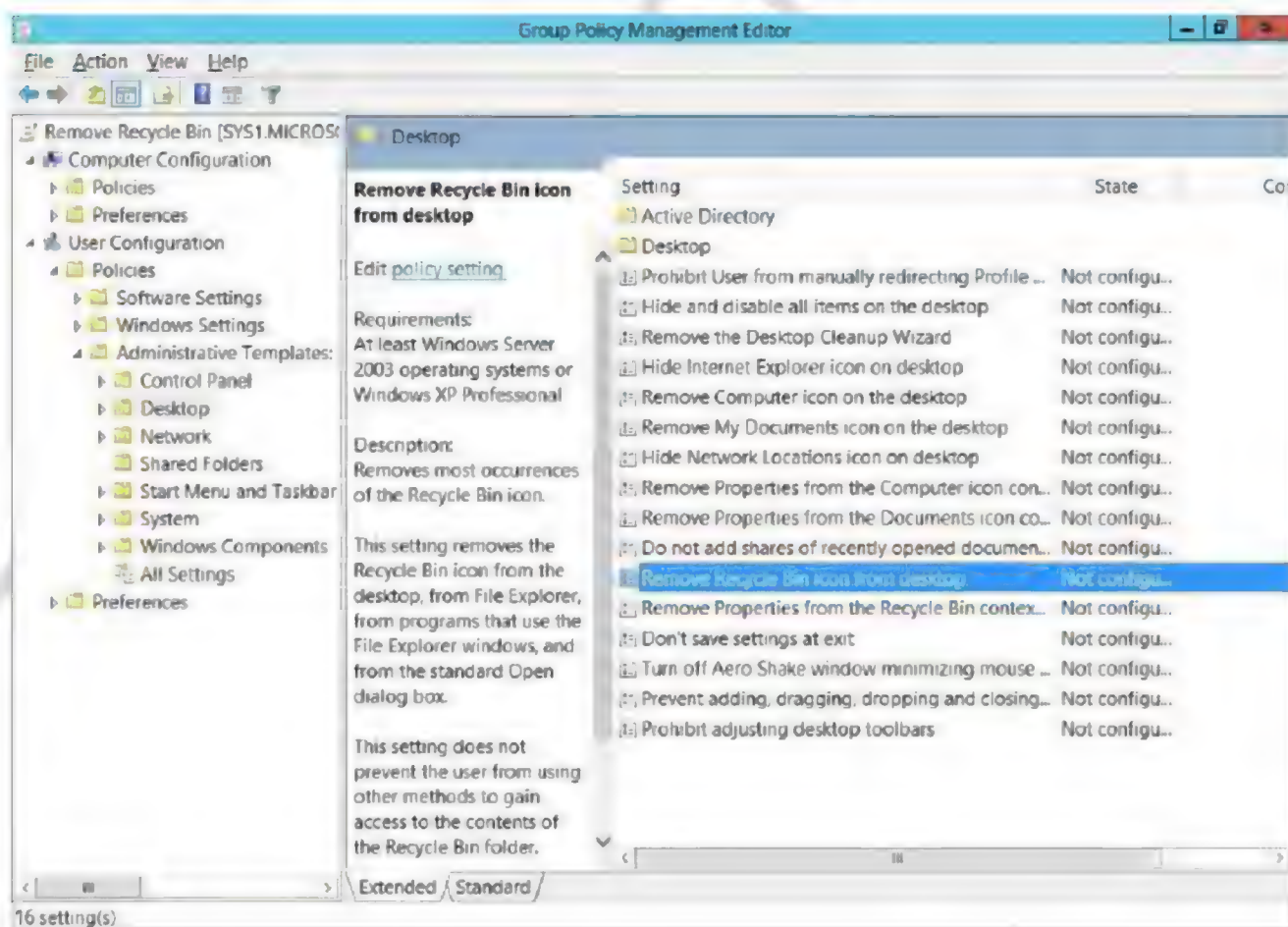




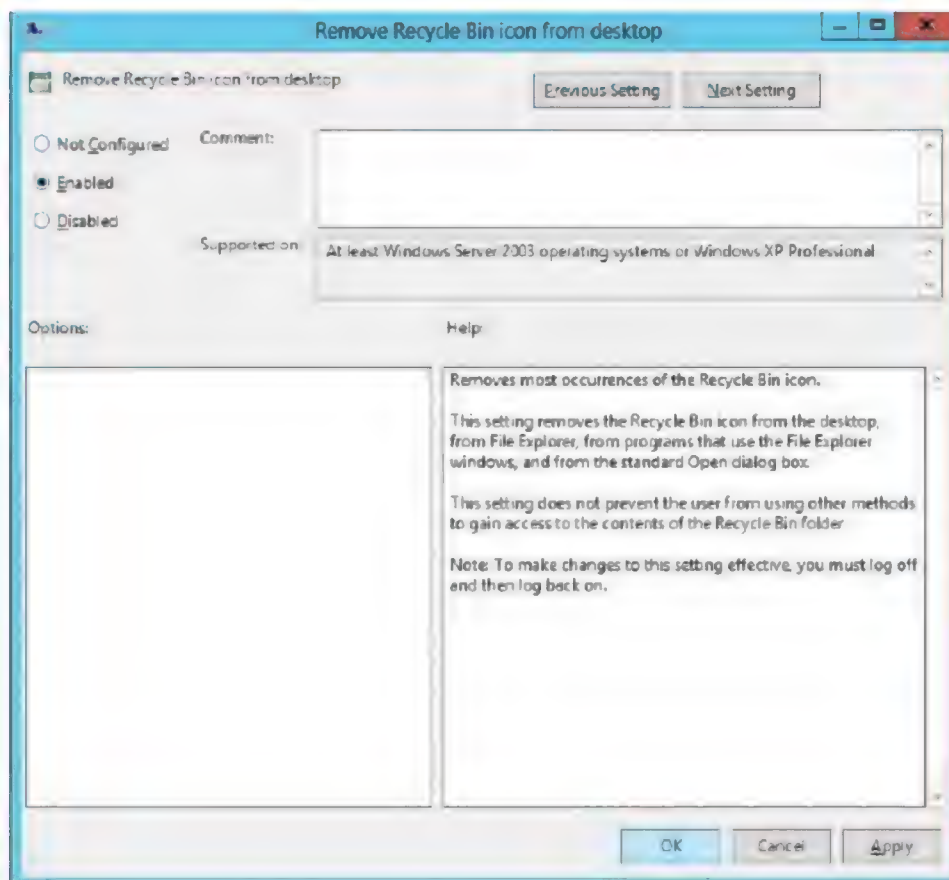
3. Select the Created GPO → Right Click Created GPO → Select **Edit**.



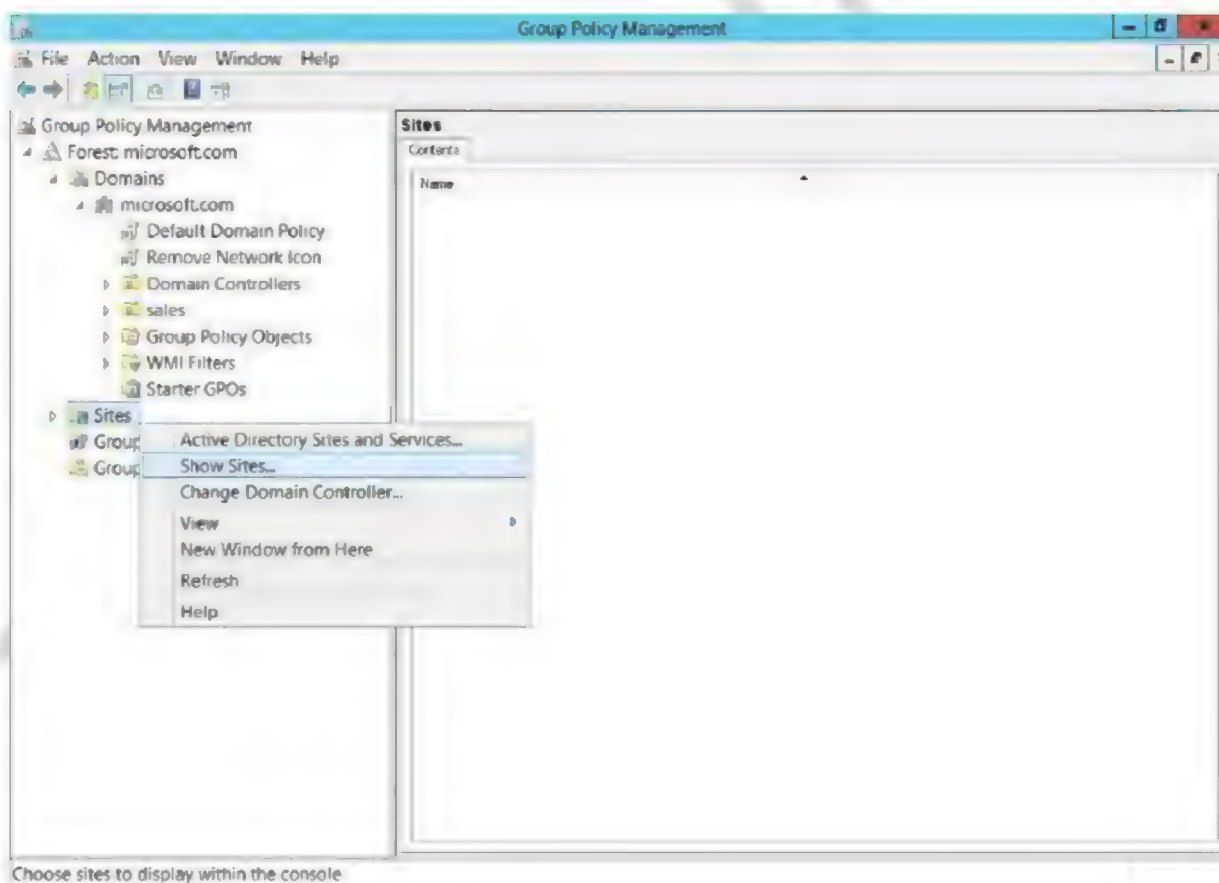
4. Select User Configuration → Policies → Administrative Templates → Desktop, select **Remove Recycle Bin icon from desktop**.



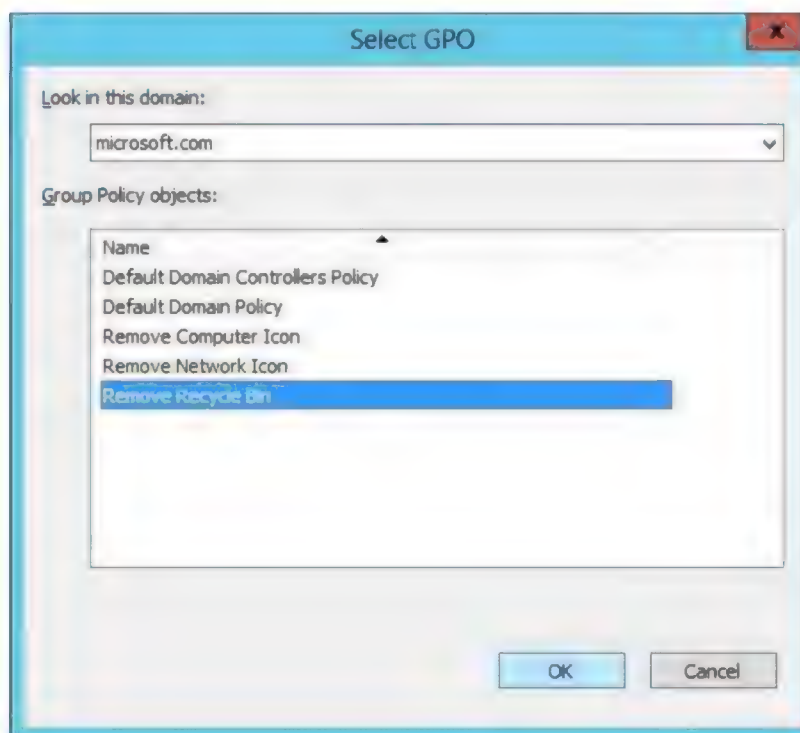
5. Right click Remove Recycle Bin icon from desktop → Properties, select **Enabled** → **OK** → **Close**.



6. Right click **Sites** → select **Show Sites** → check **Default-First-Site-Name** → click **OK** → Right Click **Default-First-Site-Name** → select **Link an Existing GPO....**



7. Select an existing GPO, (**Remove Recycle Bin**) click **OK**.



**Verification:**

1. Login as a user to **Client** or **Member Server**, and Verify for the changes.



## Lab – 34: Applying Group Policy Modeling

### Objective:

To generate reports about policies applied on users and ou

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

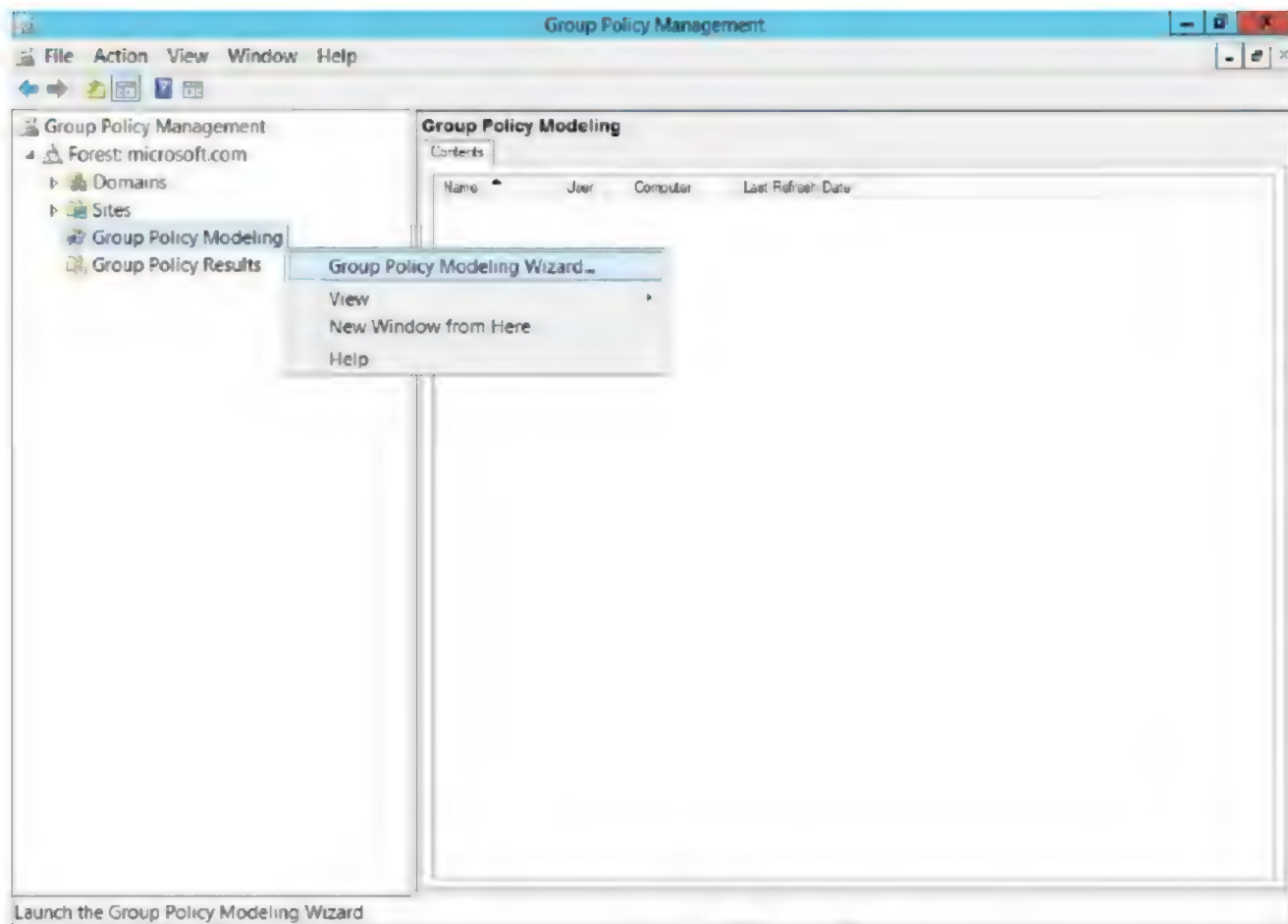
#### SYS2

##### Member Server / Client

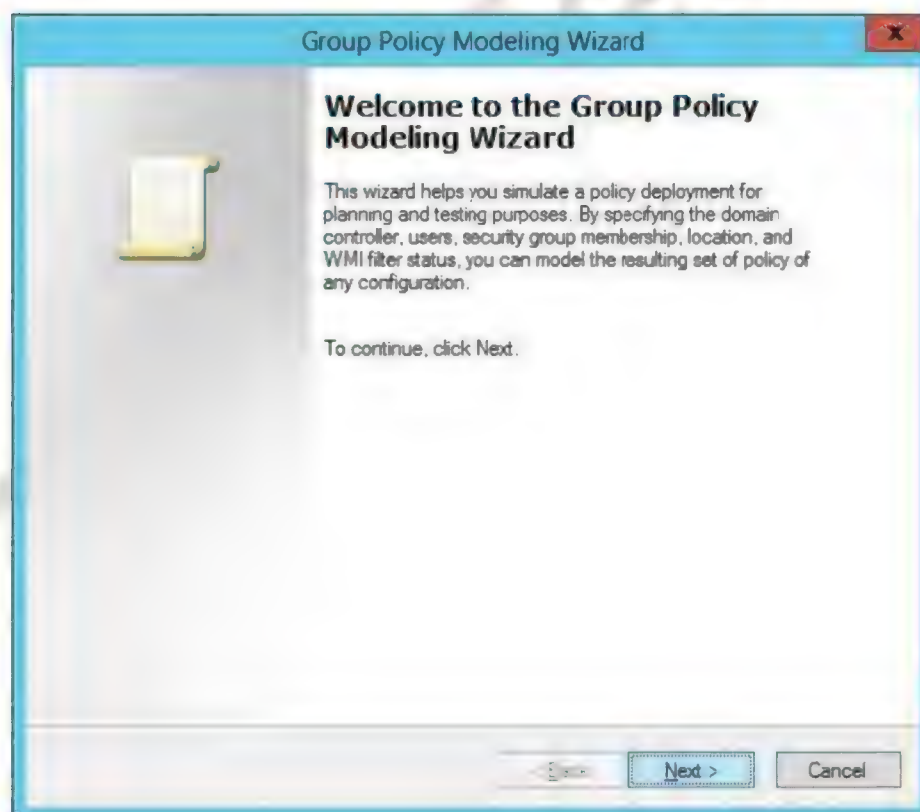
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

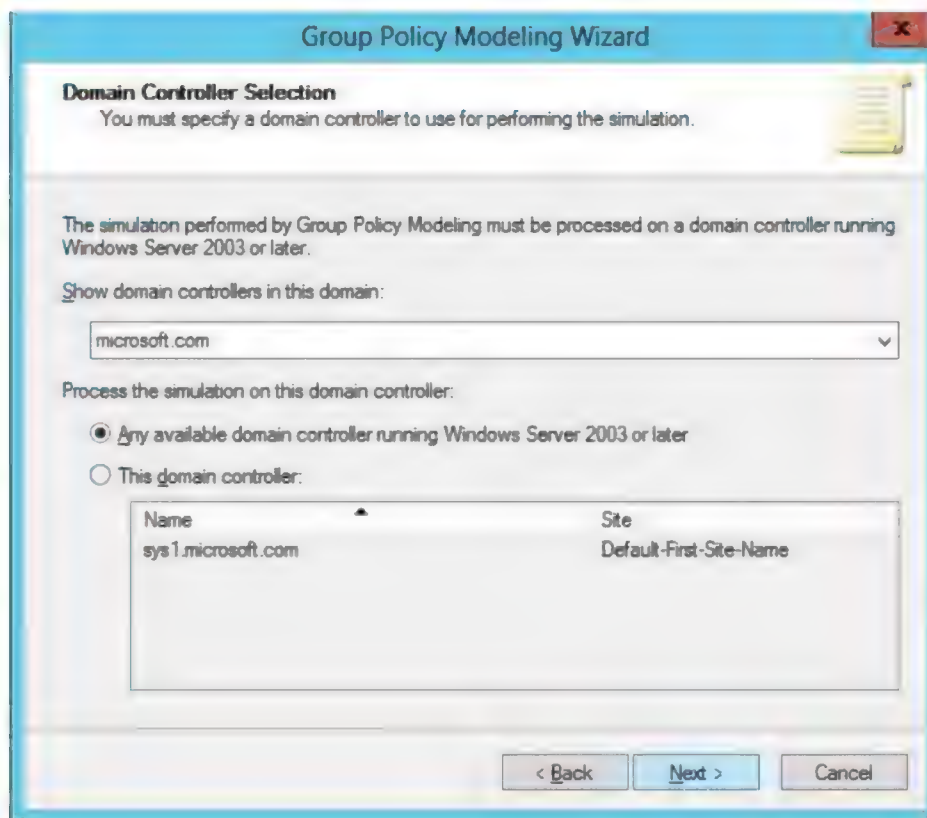
1. Go to Group Policy Management → Right Click **Group Policy Modeling** and Select **Group Policy Modeling Wizard**.



2. Click **Next**.



3. Select the domain name and click **Next**.



**Group Policy Modeling Wizard**

**Domain Controller Selection**  
You must specify a domain controller to use for performing the simulation.

The simulation performed by Group Policy Modeling must be processed on a domain controller running Windows Server 2003 or later.

Show domain controllers in this domain:  
microsoft.com

Process the simulation on this domain controller:

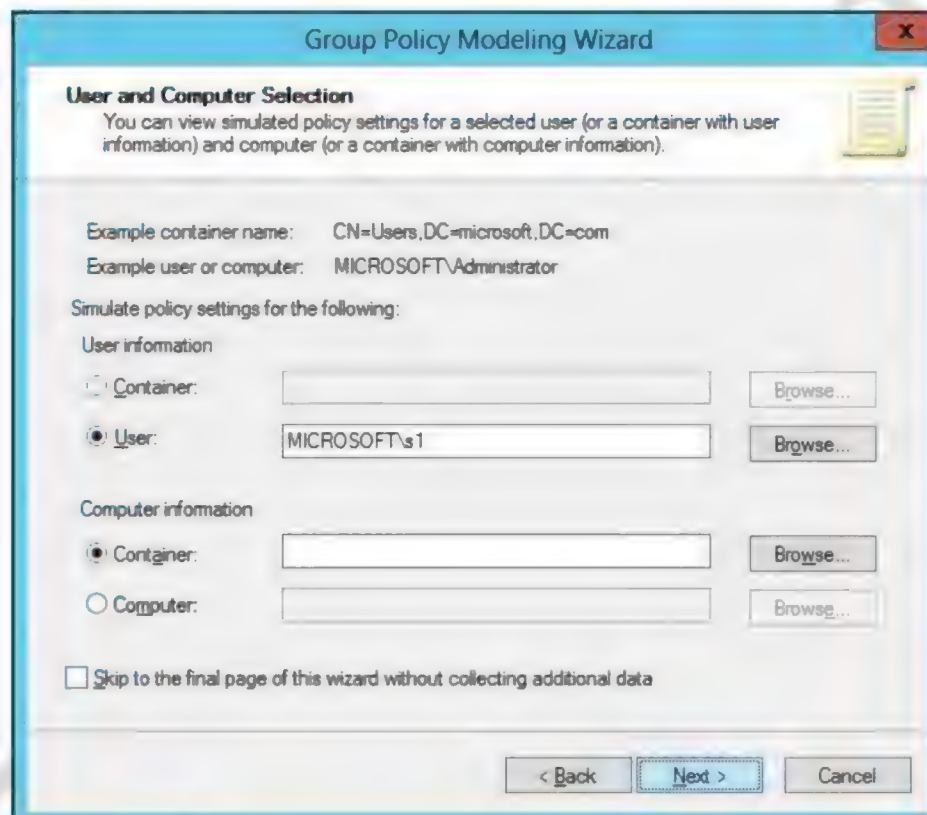
☒ Any available domain controller running Windows Server 2003 or later

☐ This domain controller:

Name	Site
sys1.microsoft.com	Default-First-Site-Name

< Back   Next >   Cancel

4. Select User and click Browse → enter the Username (s1) → click OK and **Next**.



**Group Policy Modeling Wizard**

**User and Computer Selection**  
You can view simulated policy settings for a selected user (or a container with user information) and computer (or a container with computer information).

Example container name: CN=Users,DC=microsoft,DC=com  
Example user or computer: MICROSOFT\Administrator

Simulate policy settings for the following:

User information

☐ Container:      Browse...

☒ User:      MICROSOFT\s1      Browse...

Computer information

☒ Container:      Browse...

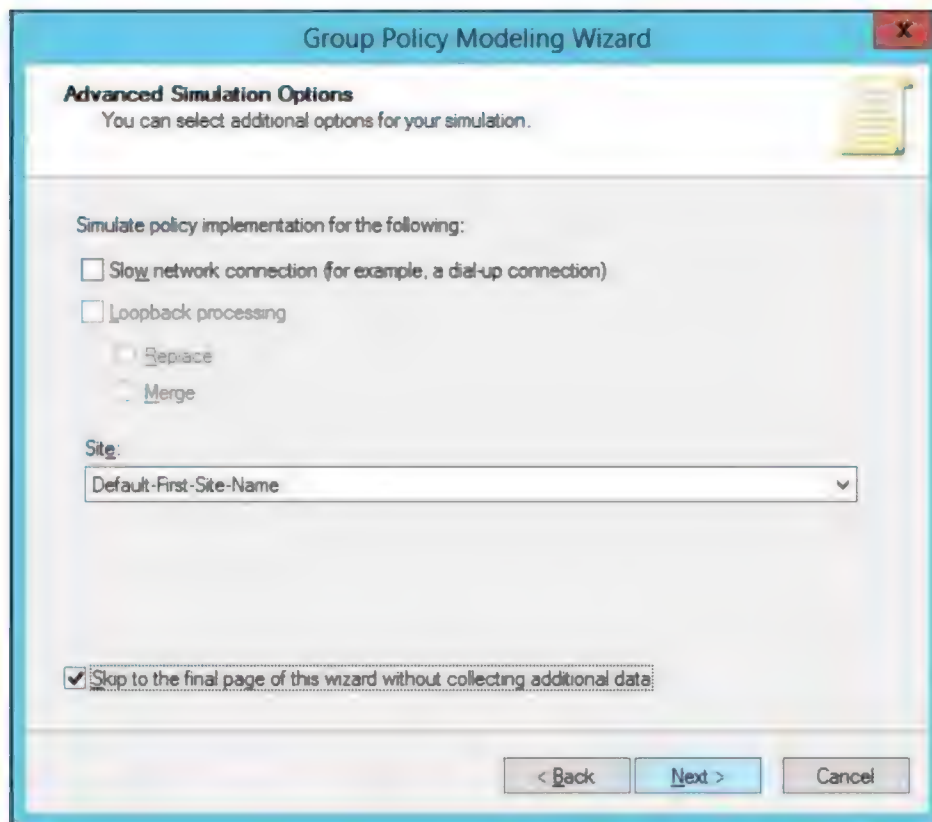
☐ Computer:      Browse...

☐ Skip to the final page of this wizard without collecting additional data

< Back   Next >   Cancel



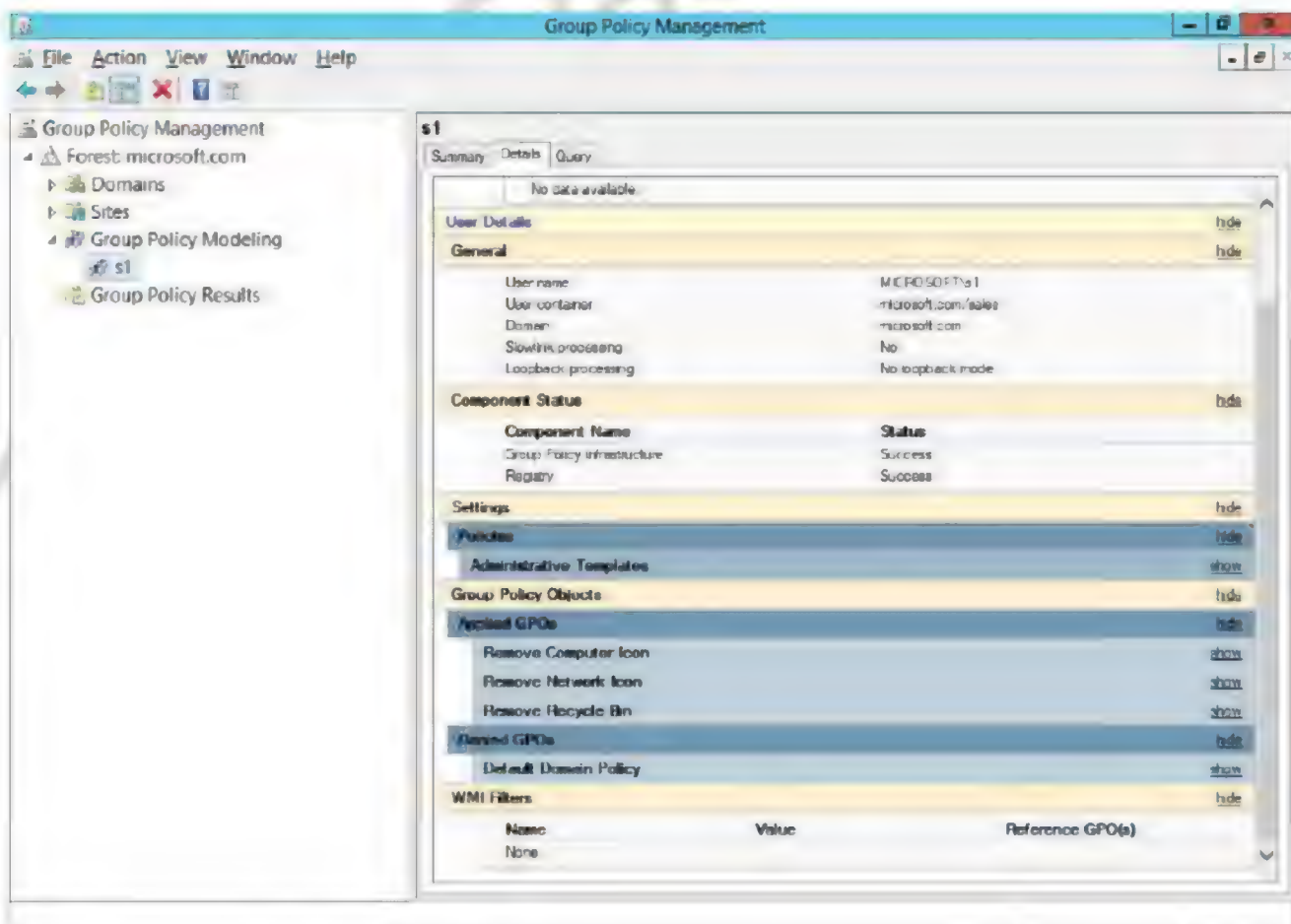
- Select the site (**Default-First-site-Name**) and check skip to final page, click **Next**.



- Click **Next** → **Finish**.

### Verification:

- Click Details on the summary page and verify the policies applied on the User.



## Lab – 35: Applying Software Deployment Policy

### Objective:

To provide software to users through network

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

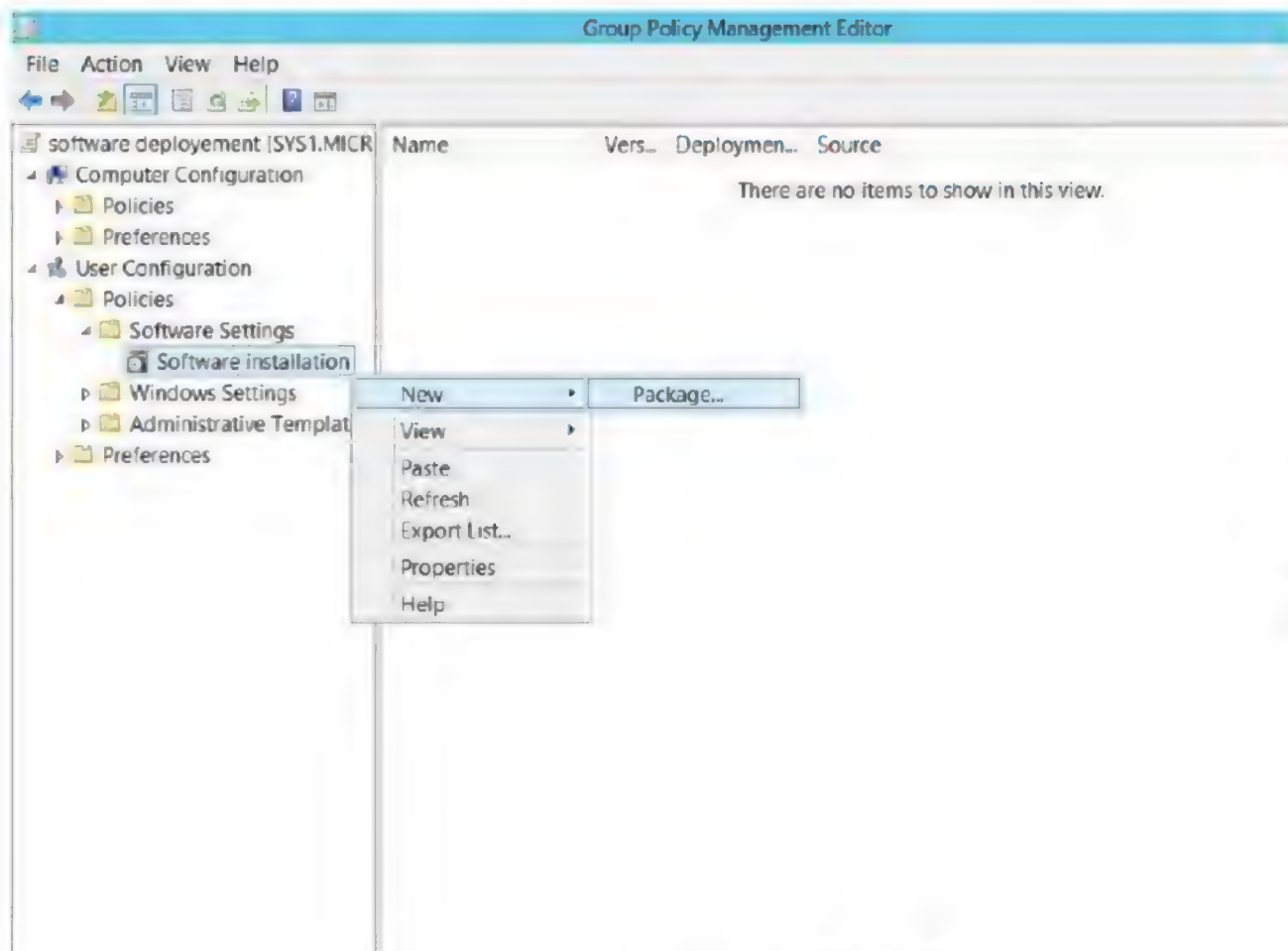
1. Logon to D.C as Administrator, Create a Shared folder with (.msi) applications in it
2. Go to **Group Policy Management**.



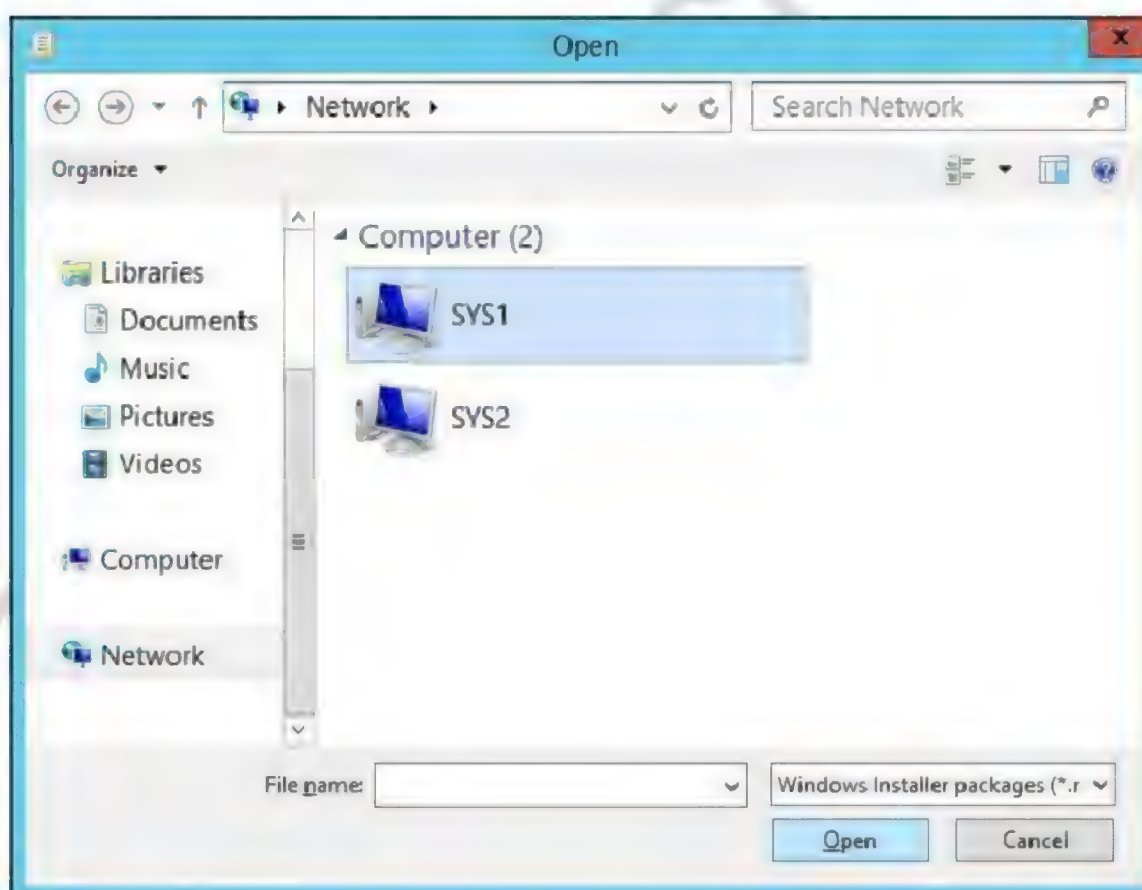
3. Right click OU (**Sales1**) → **Create a GPO in this domain and Link it here** → Enter the name (**Software Deployment**) → click **OK**, Right click the policy and click **Edit**.



4. User Configuration → Expand Policies → Expand Software settings → Right click Software Installation → Select **New** → **Package**



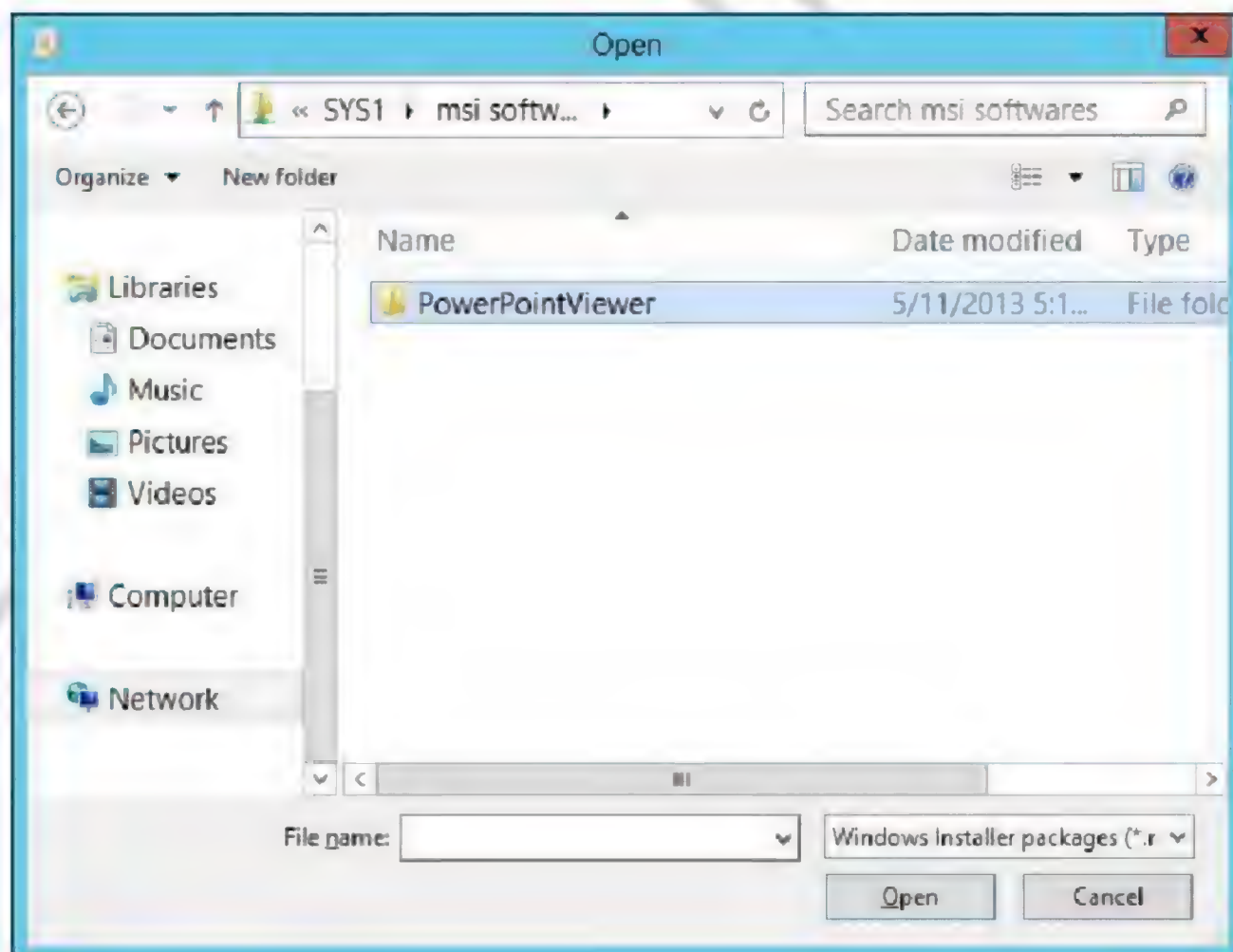
5. From the left pane, select Network, Open **SYS1** (Server containing shared folder).



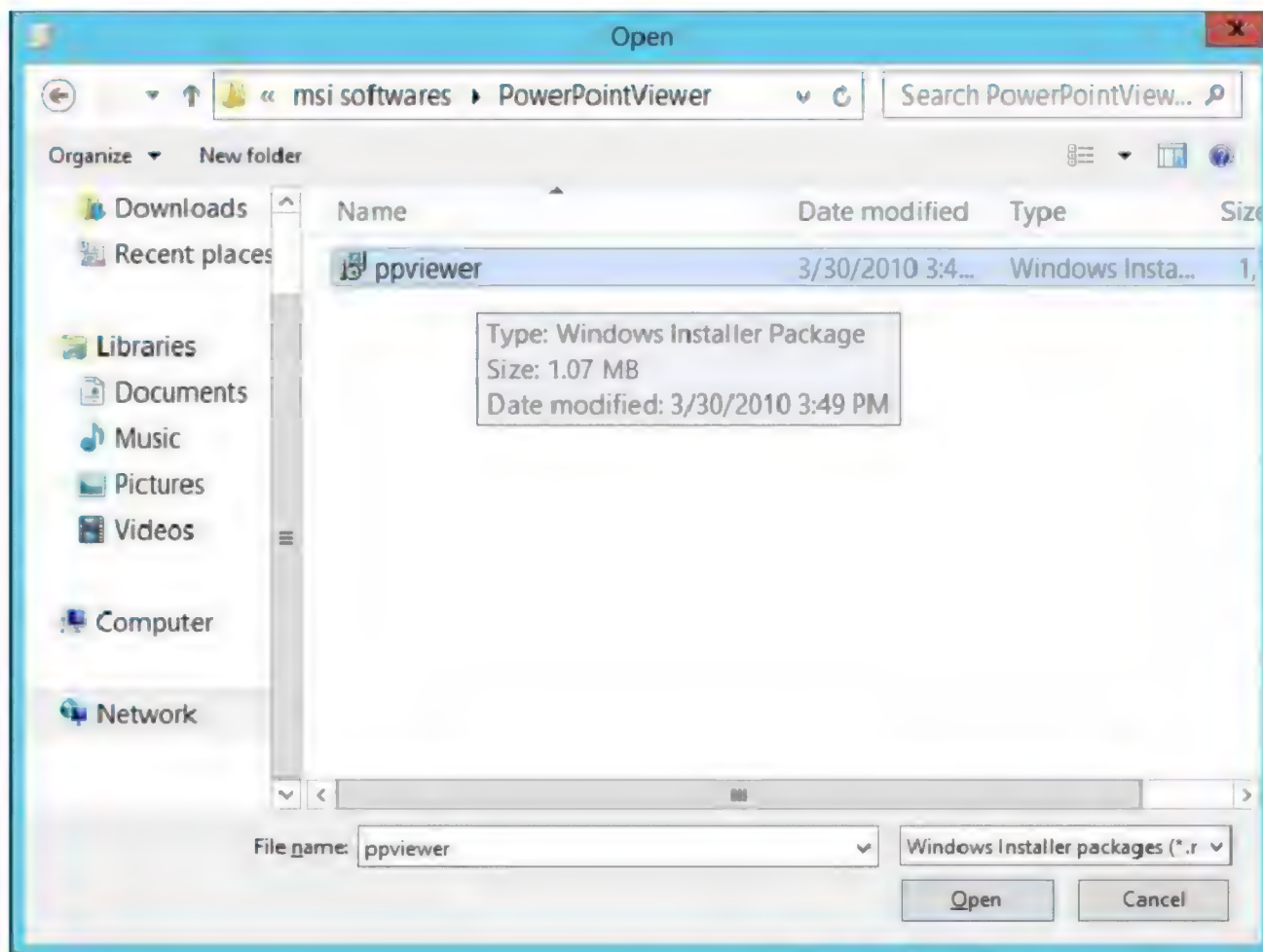
6. Select the **MSI Softwares** Shared Folder → click **Open**.



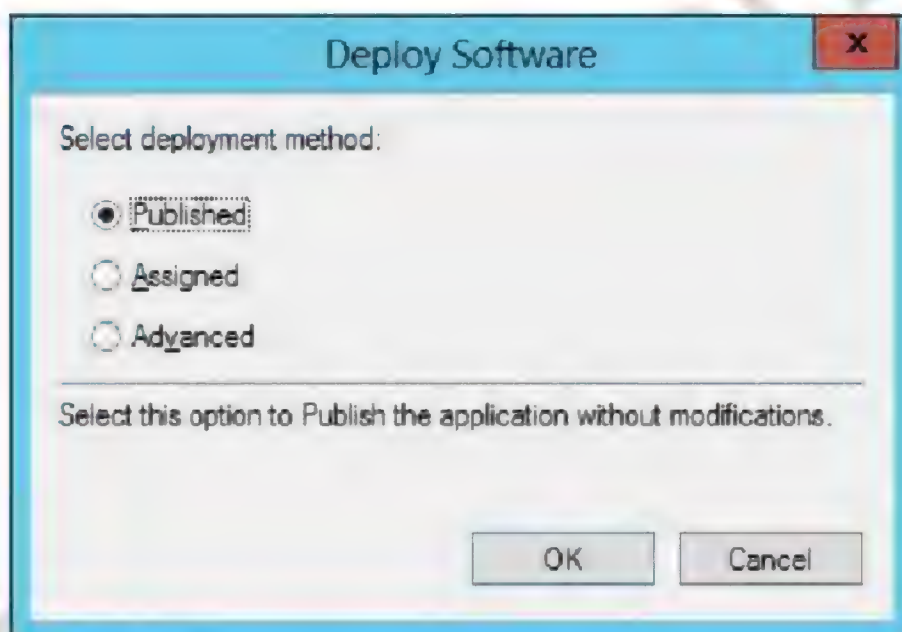
7. Select the Application Folder (**Power Point Viewer**) → click **Open**.



8. Select the Application (**PPVIEWER**) → click **Open**.



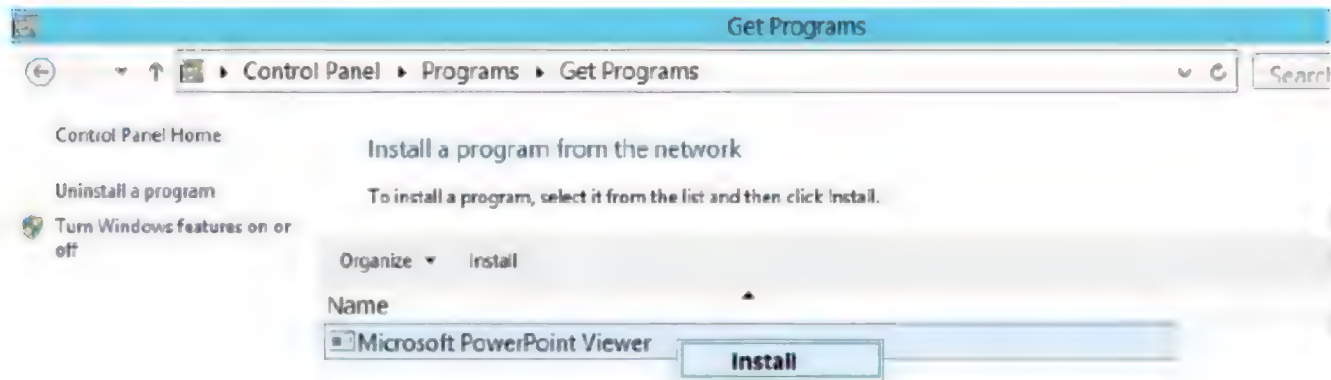
9. Select the **Method to Deploy Application (Published)** and click **OK**.





**Verification:**

1. Go to Member Server and login as **user1**.
2. Go to Control Panel, click **Programs and Features**.
3. Click **Install a Program from the Network**, Select the **Application** and **Install**



## Lab – 36: Applying Scripts using Group Policy.

### Objective:

To deploy scripts using group policies

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

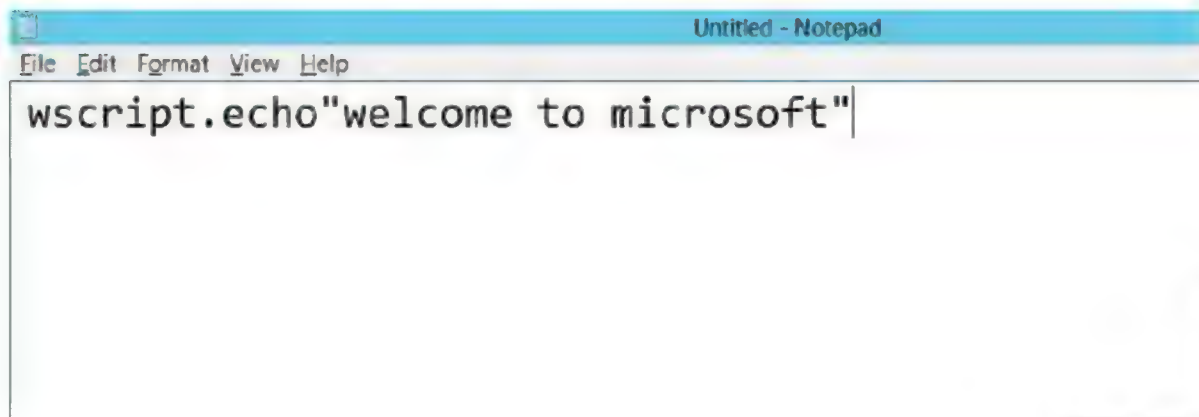
##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

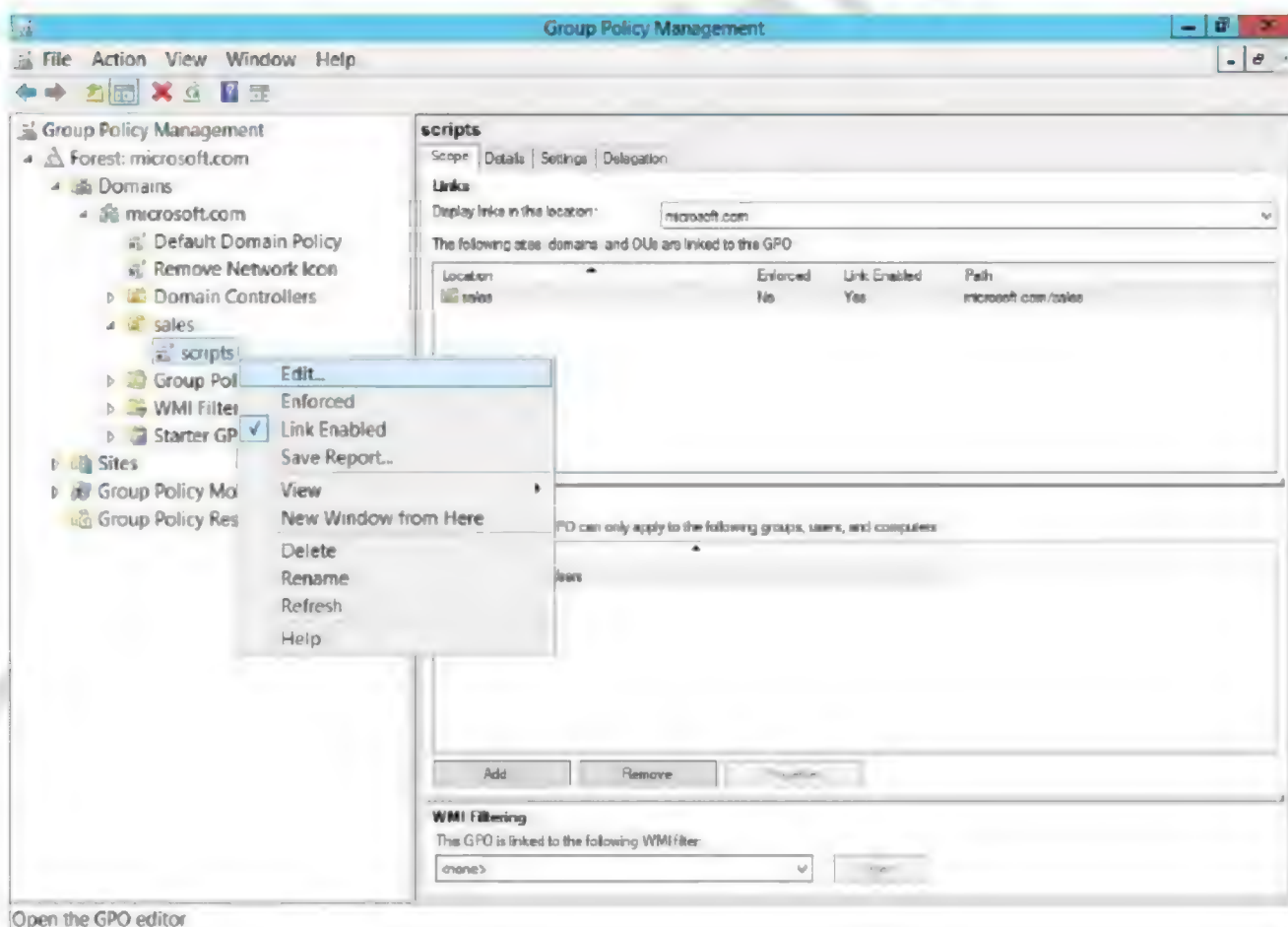


**Steps:**

1. Log on to D.C, create a Shared Folder **User Scripts** with Everyone as Read/write.
2. Go to Start, type Notepad in Search Apps, and select **Notepad**.
3. Enter the text **wscript.echo "Welcome to Microsoft"**

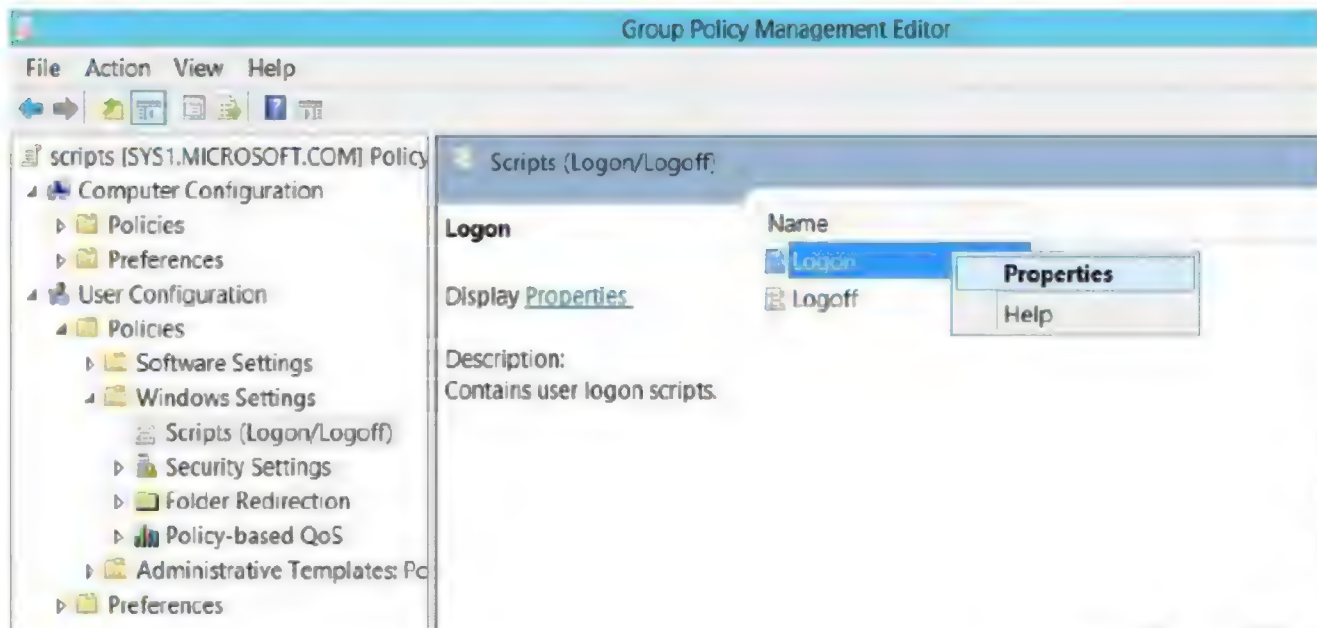


4. Save the file in the Shared folder **User Scripts** as **Logon.vbe**
5. Go to Group Policy Management → Right click **OU (Sales1)** → **Create a GPO in this domain and Link it here** and enter the name **Script**, click **OK**, Select the GPO Right Click and select **Edit**.

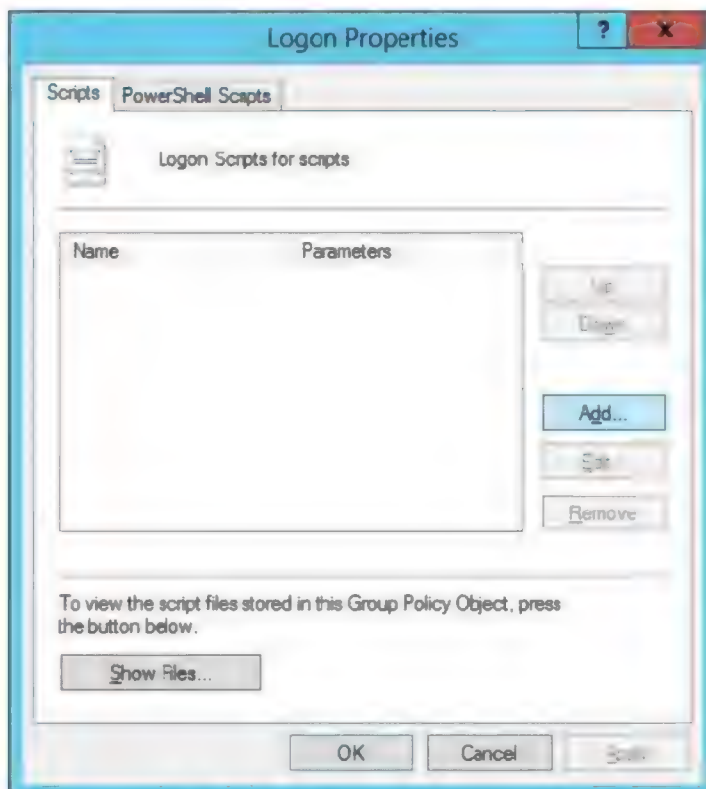




6. Expand User Configuration → Expand Policies → Windows Settings → Scripts → Logon → Properties.



7. Click **Add**.



8. Enter the UNC path for the Script in the shared folder `\\SYS1\Userscripts\logon.vbe` and click **OK** → **Apply** and **OK**.

**Verification:**

1. Go to Member Server and login as USER1 and verify for the **Message**.



## Lab – 37: Applying Folder Redirection using Group Policy

### Objective:

To redirect folders of users to servers

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

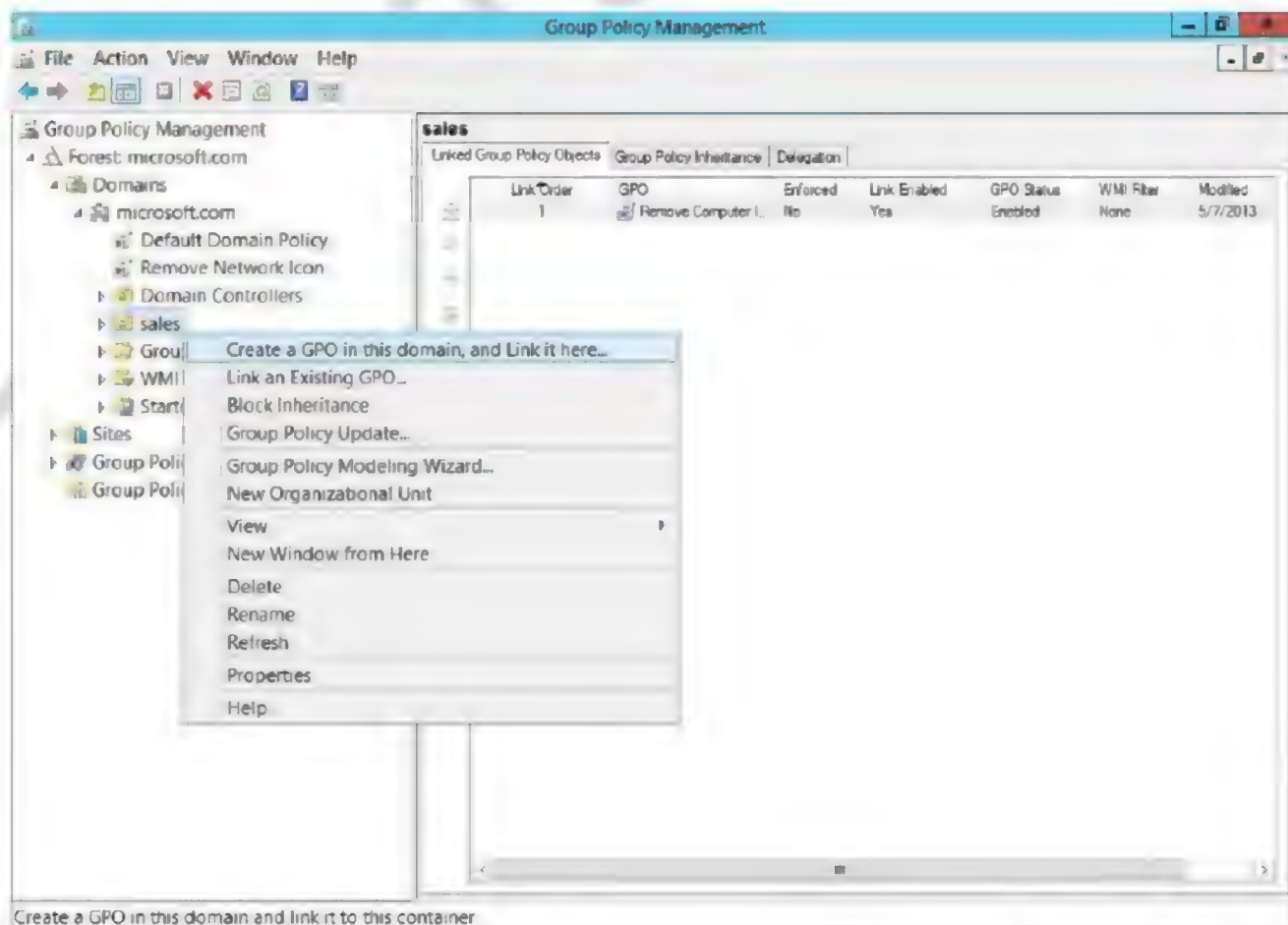
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to D.C, create a Shared Folder (Folder Redirection) with everyone Read/Write.
2. Press Windows Key to go to Start, select **Group Policy Management**.

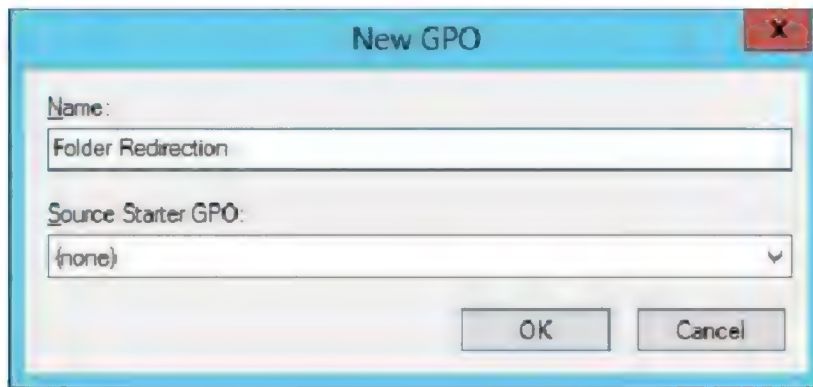


3. Right click OU (Sales) → Select **Create a GPO...**

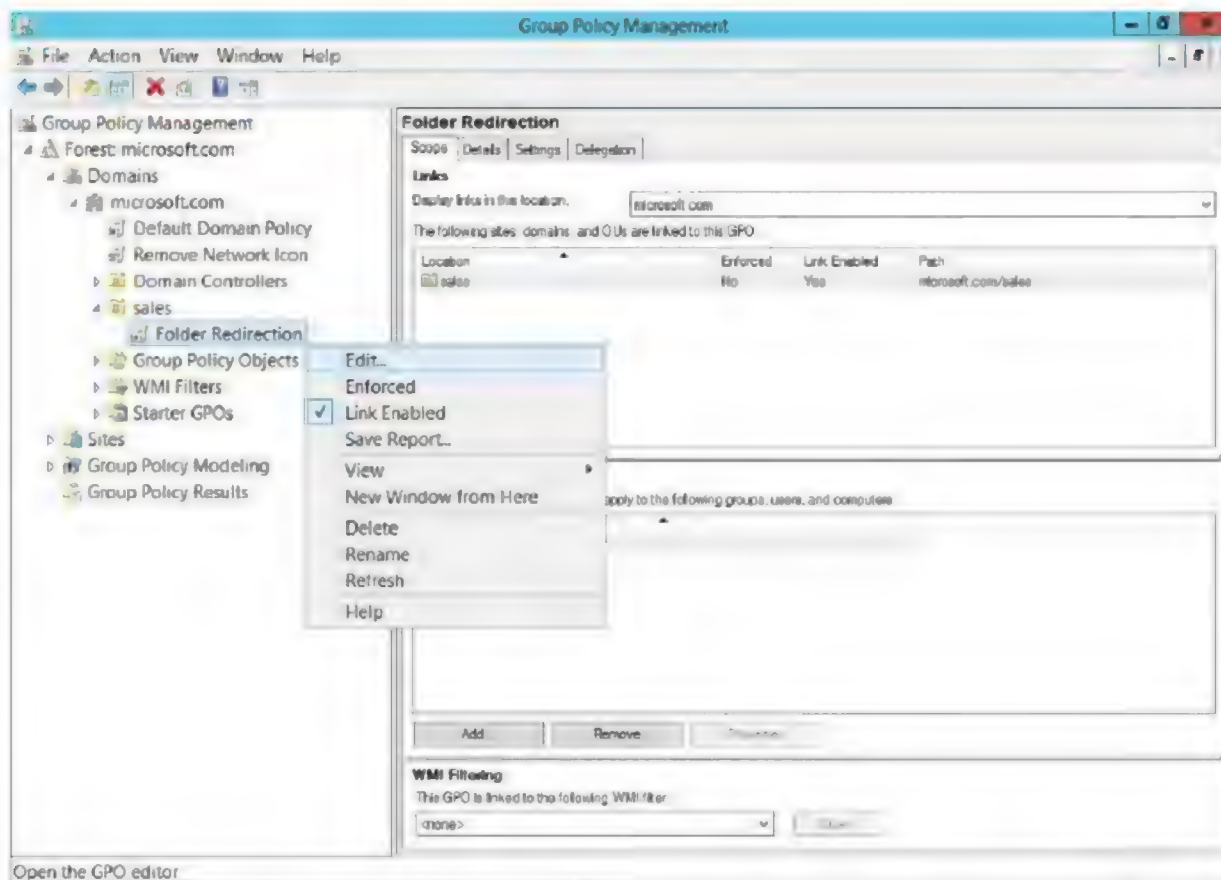




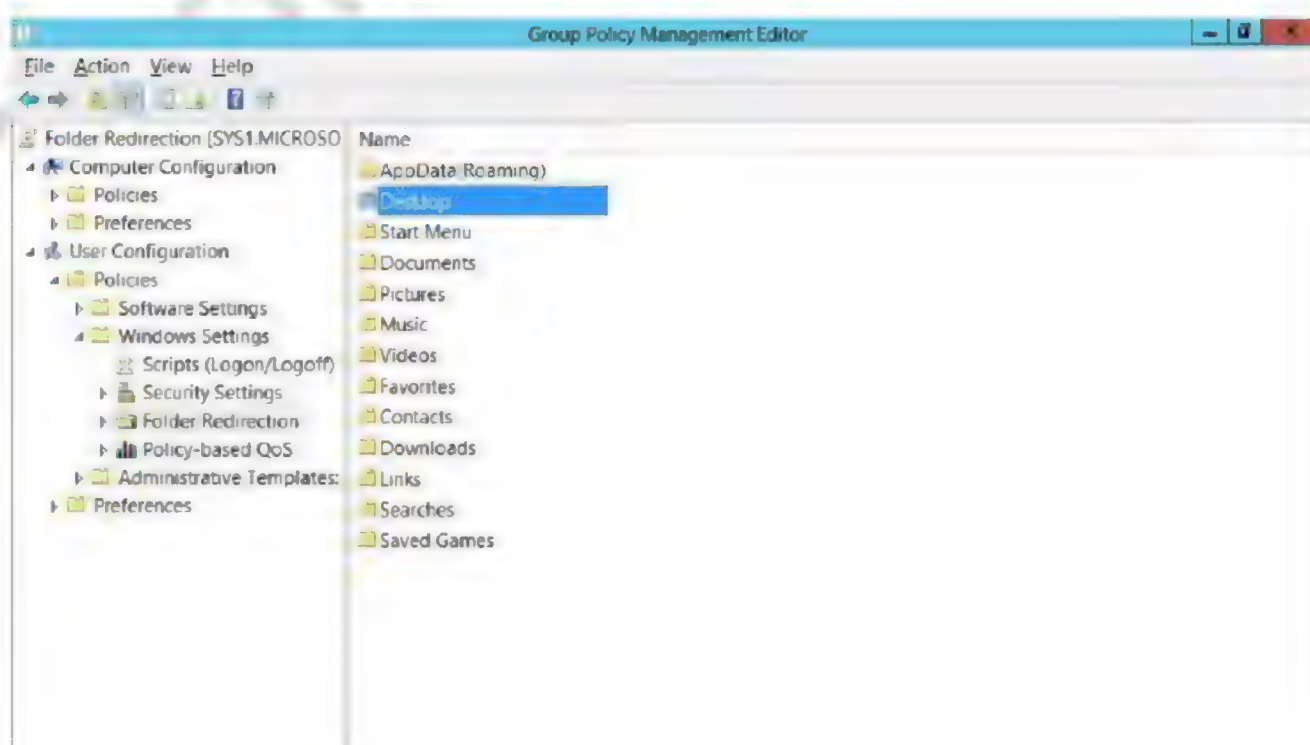
4. Enter name (Ex: **Folder Redirection**) and click **OK**.



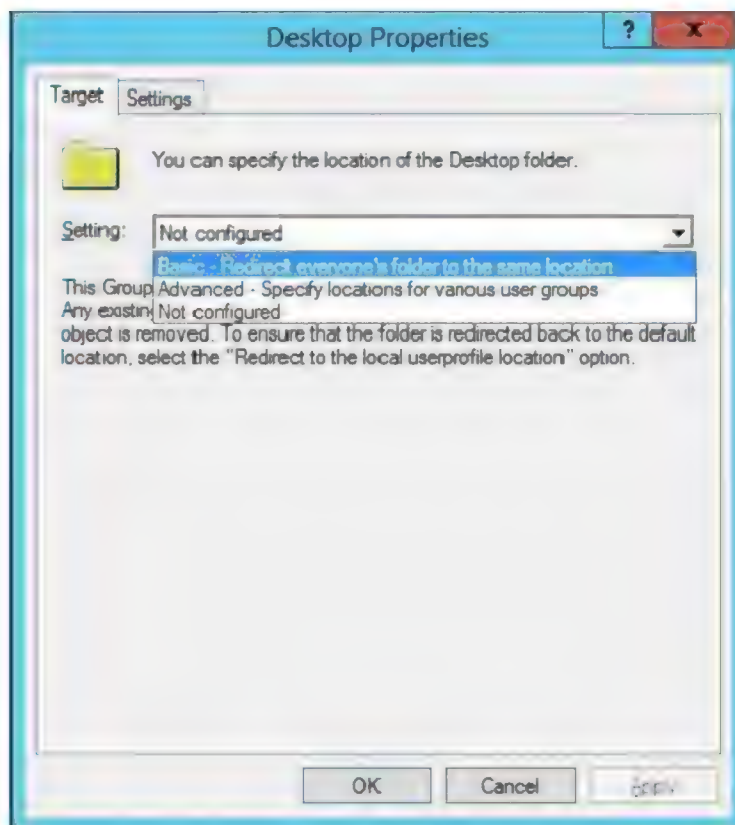
5. Right Click created GPO, select **Edit**.



6. Expand User configuration → Policies → Windows Settings → Folder Redirection → Select Desktop → Right click **Desktop** → Select **Properties**

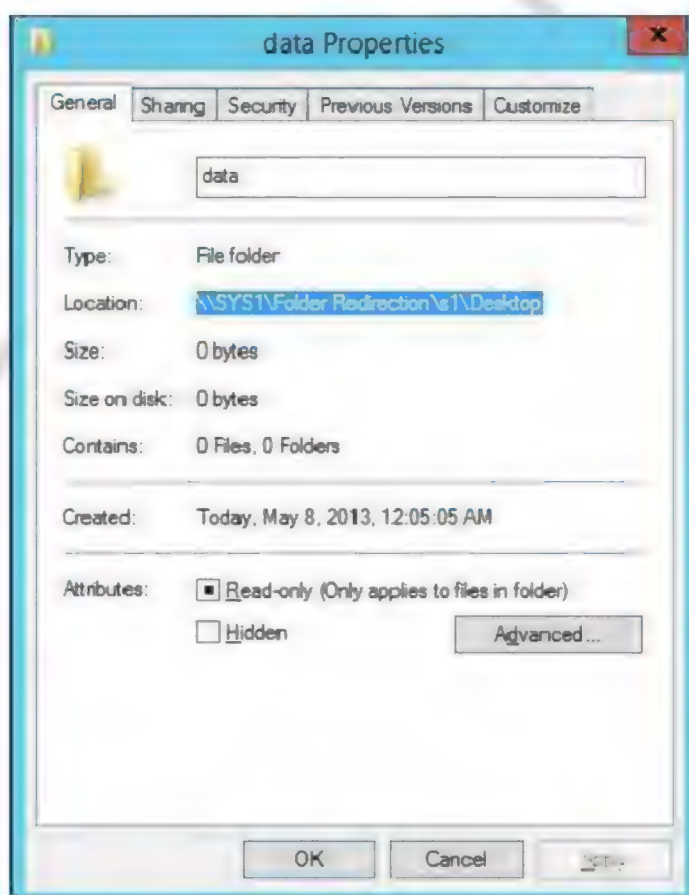


7. Select **Basic** Redirection, select **Create a folder for each user under the root path**, click **Browse**→select the shared folder from Network, **\\SYS1\Folder Redirection**, click **Apply** and **OK**.



**Verification:**

1. Login as user (**S1**) in client system.
2. Create a folder on desktop, Right Click on the folder → **properties** and check the path, it should show **Network path (\\SYS1\FolderRedirection\S1\Desktop)**.



## Lab – 38: Applying Auditing Policy

### Objective:

To apply audit policies to generate events for logon etc

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

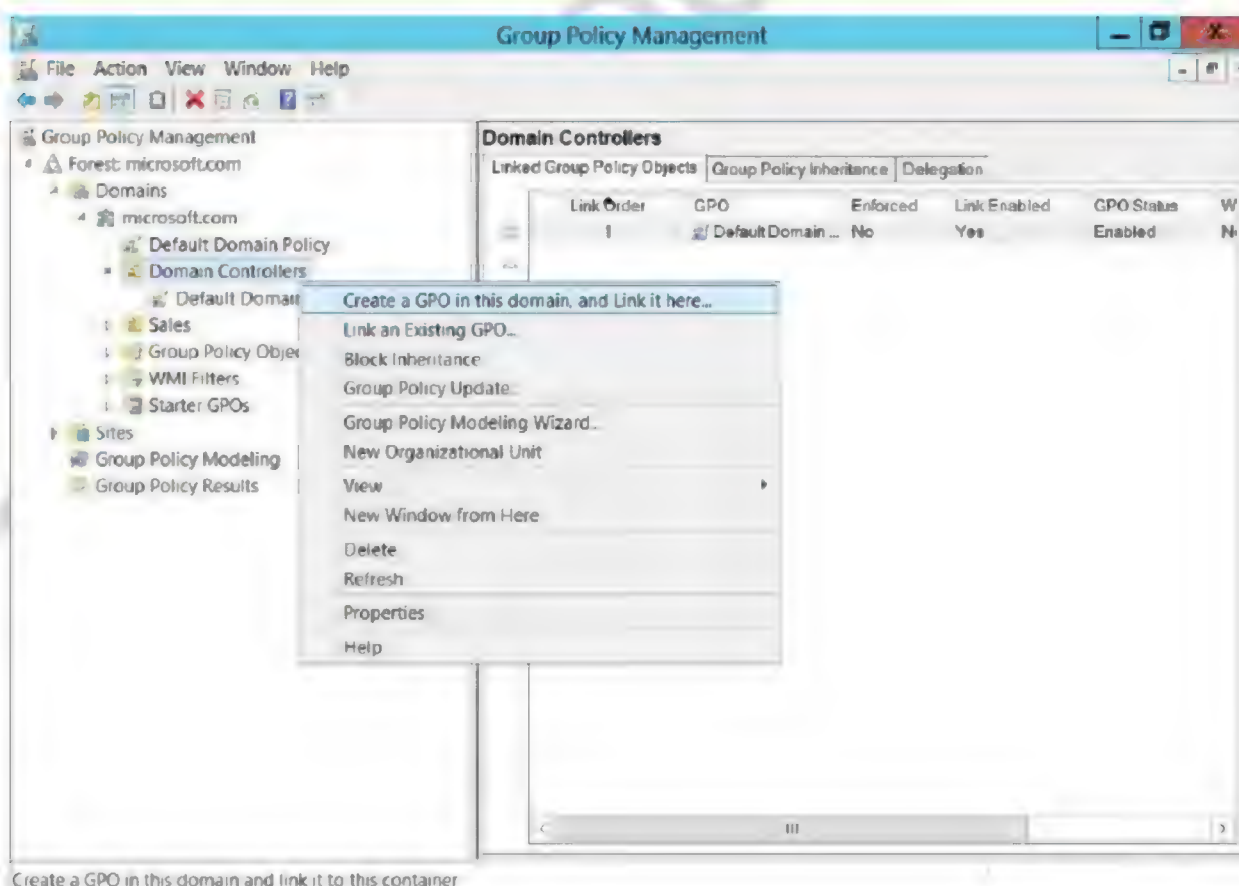


**Steps:**

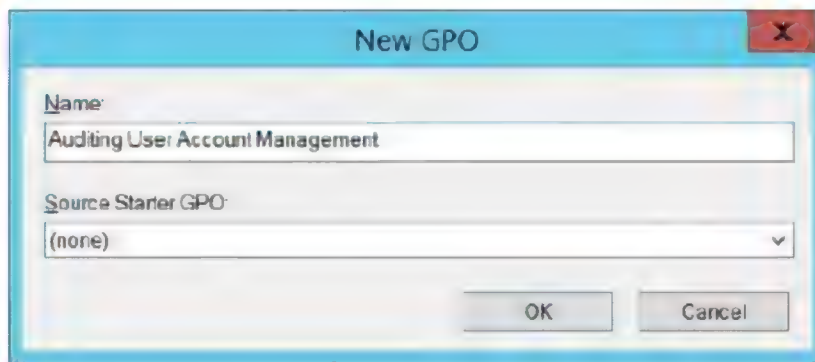
1. Press Windows Key to go to Start, select **Group Policy Management**.



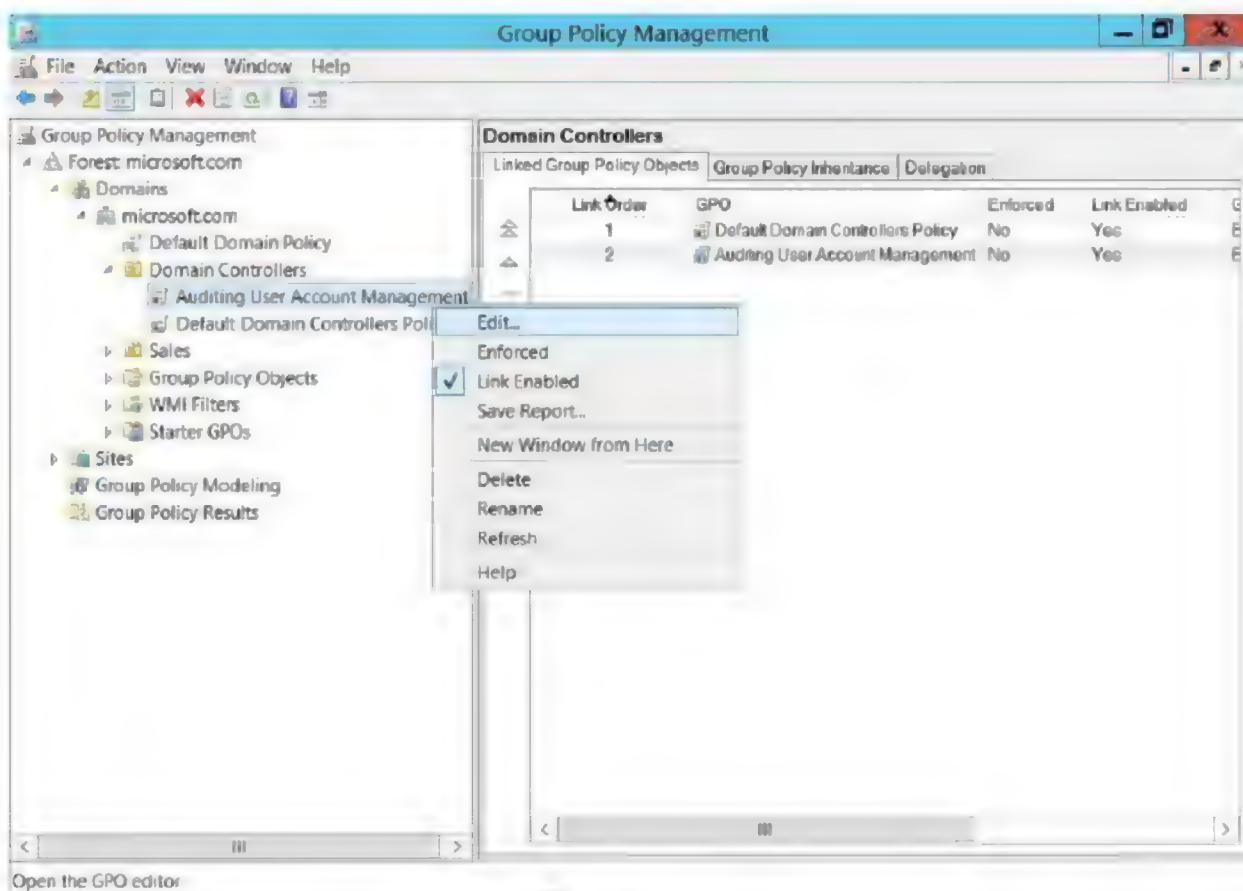
2. Right click Domain Controllers → Select **Create a GPO...**



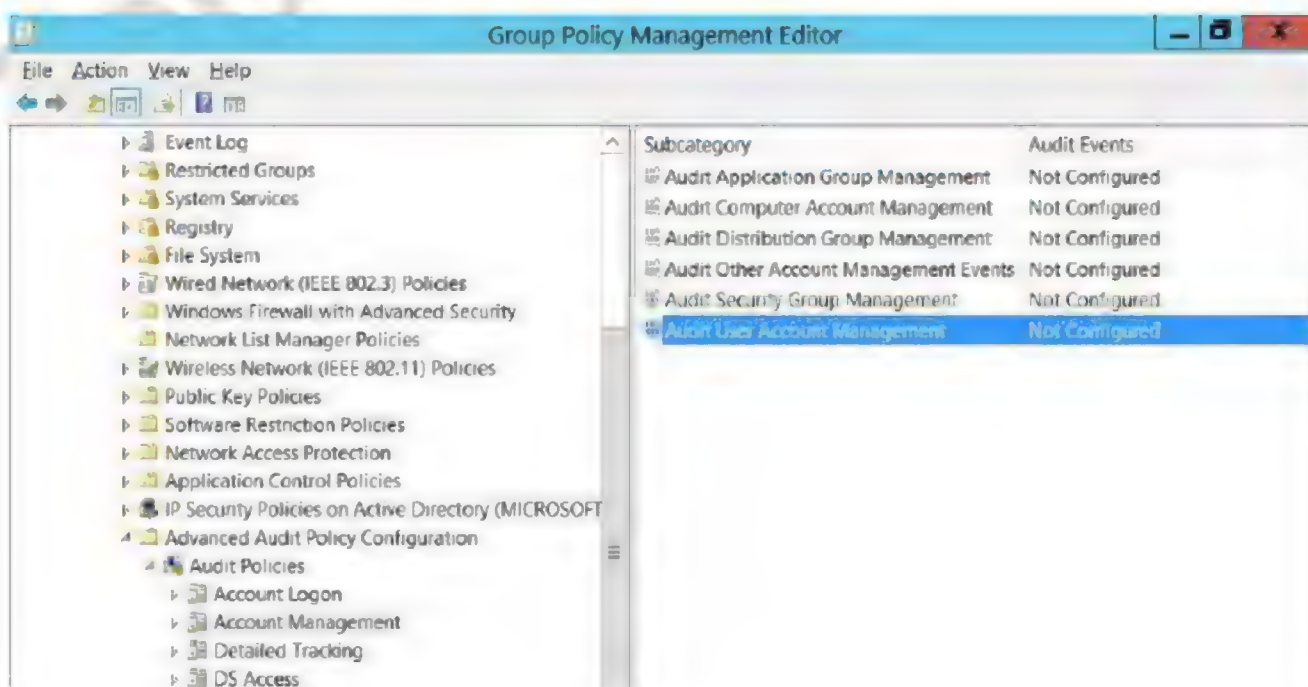
- Enter name (Ex: **Auditing User Account Management**) and click **OK**.



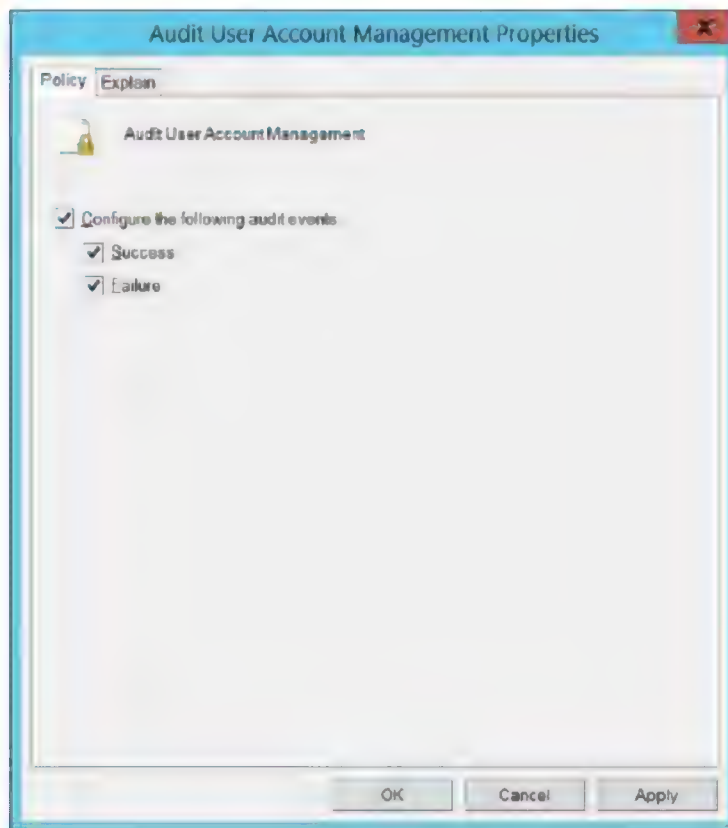
- Right Click created GPO, select **Edit**.



- Expand **Computer configuration** → **Policies** → **Windows Settings** → **Security Settings** → **Advanced Audit Policy Configuration** → **Audit Policies** → **Account Management** → Right click **Audit User Account Management** → **Select Properties**

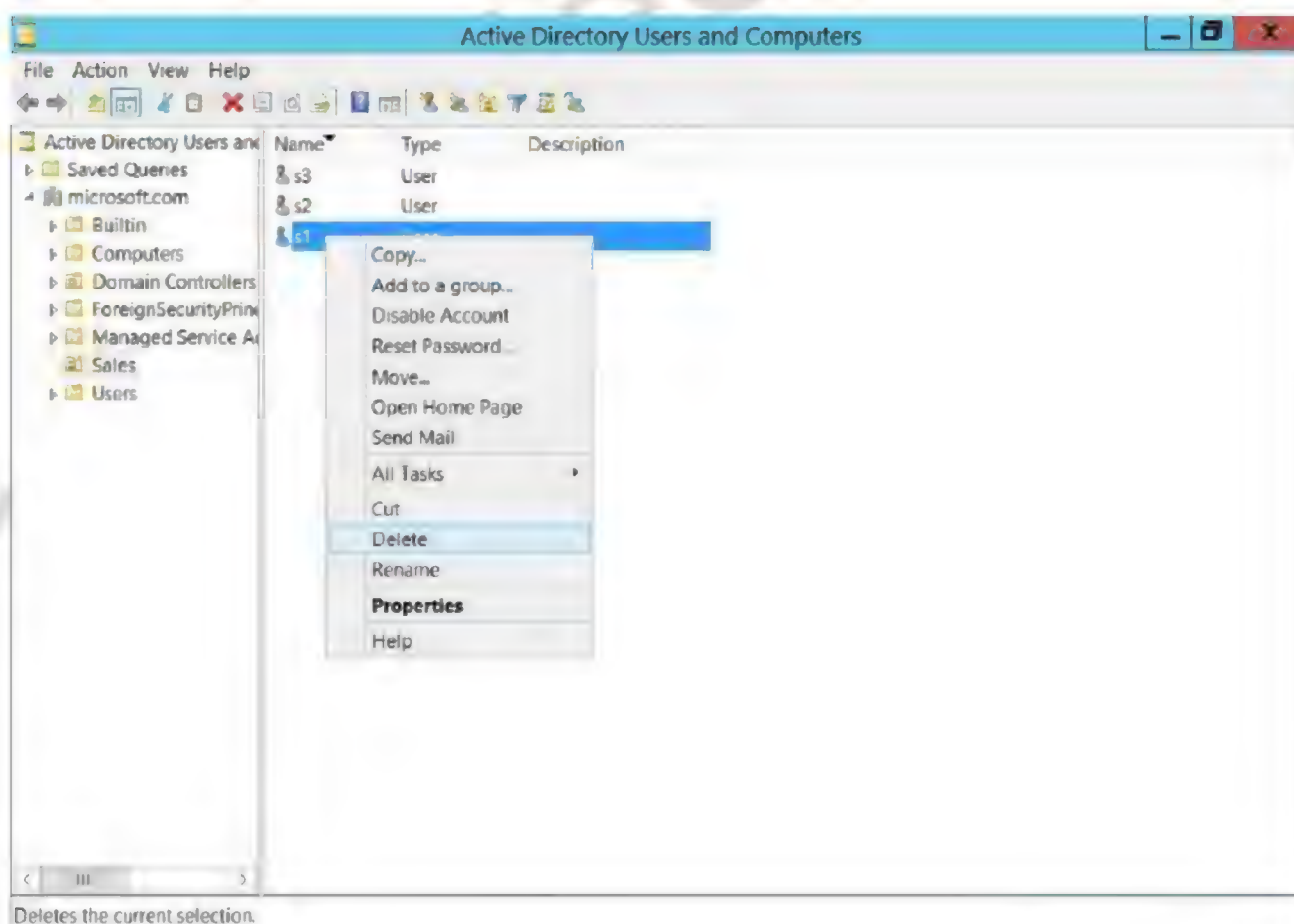


6. Check the box, **Configure the following audit events** and Select **Success** and **Failure**.



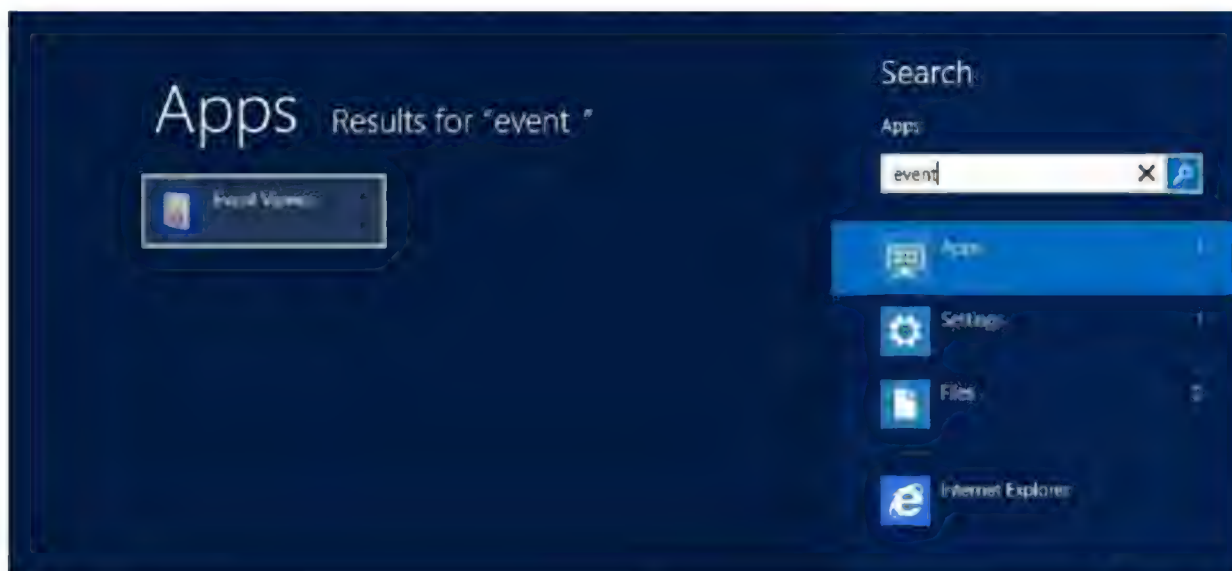
#### **Verification:**

1. Login as Administrator on D.C, go to Active Directory Users and Computers and delete a user (S1).

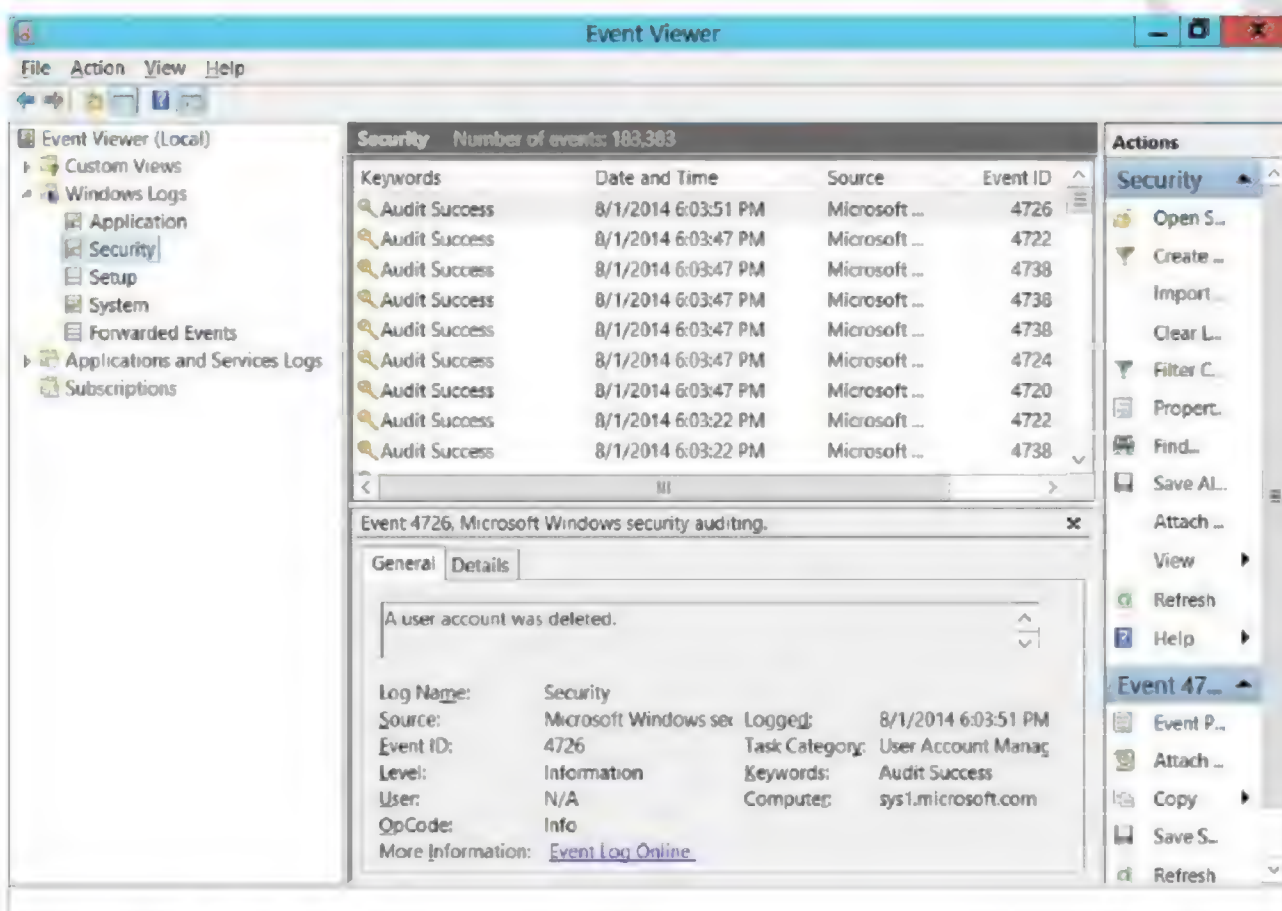




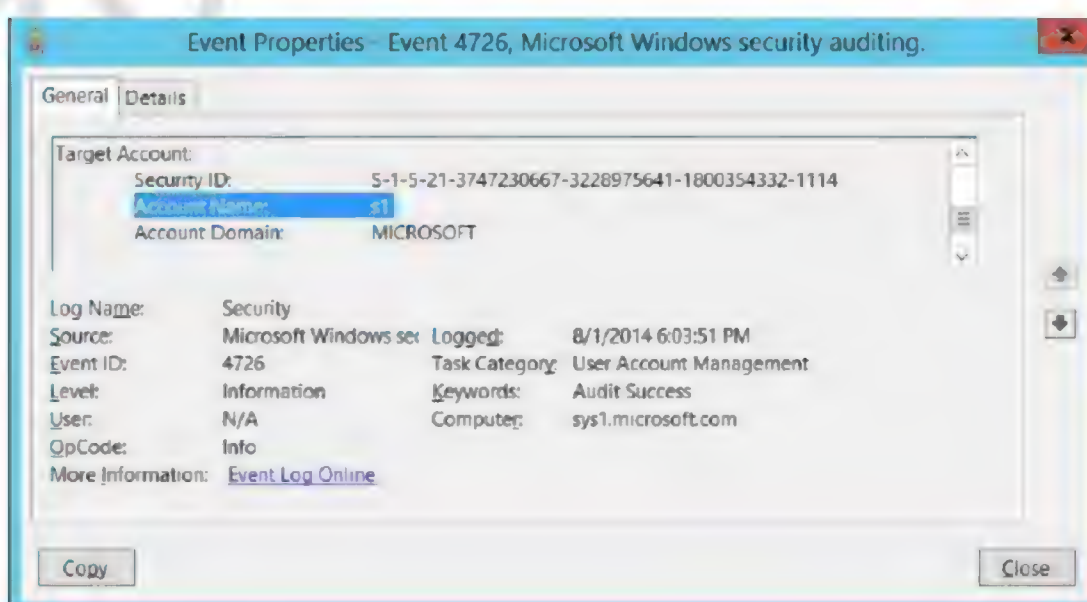
- Go to Start, Type Event in Search Apps and select **Event Viewer**



- Expand Windows Logs → Security and select the Event Audit Success **Properties**.



- Verify the event displaying user s1 deleted by Administrator.



## Lab – 39: Configuring Preferences using Item-level targeting

### Objective:

To configure group policy preferences

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

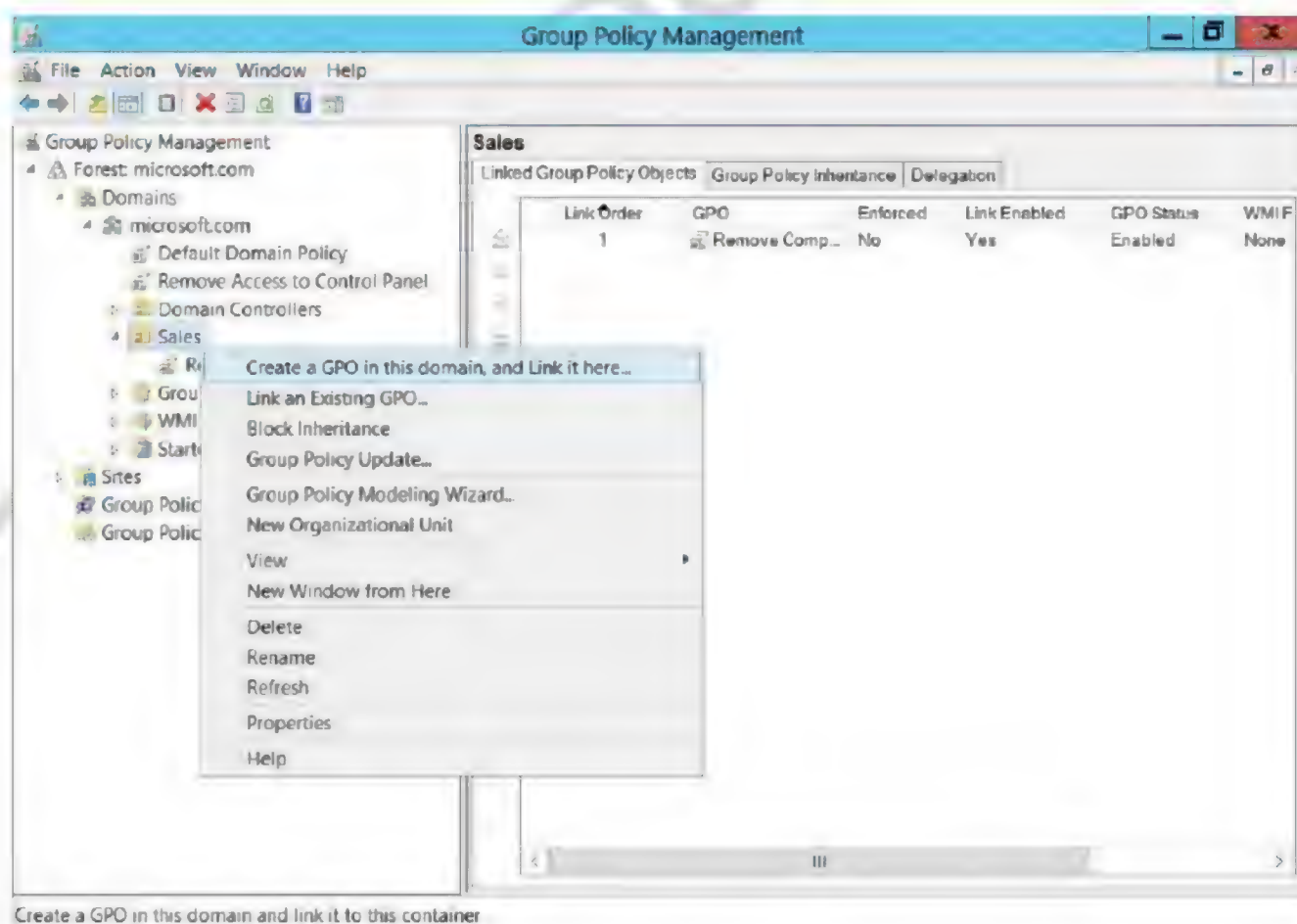


**Steps:**

1. Press Windows Key to go to Start, select **Group Policy Management**.

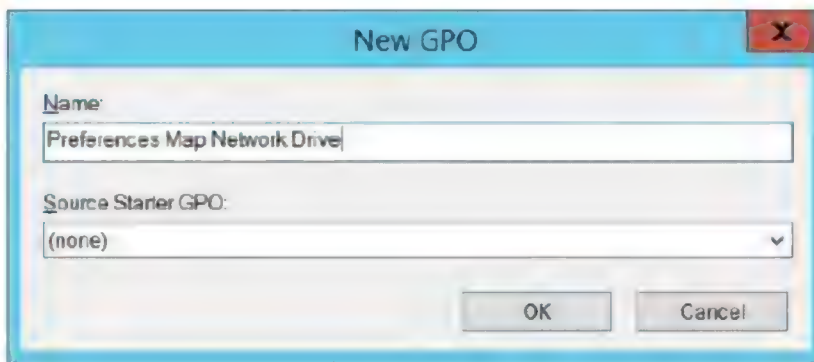


2. Right click Sales ou → Select **Create a GPO...**

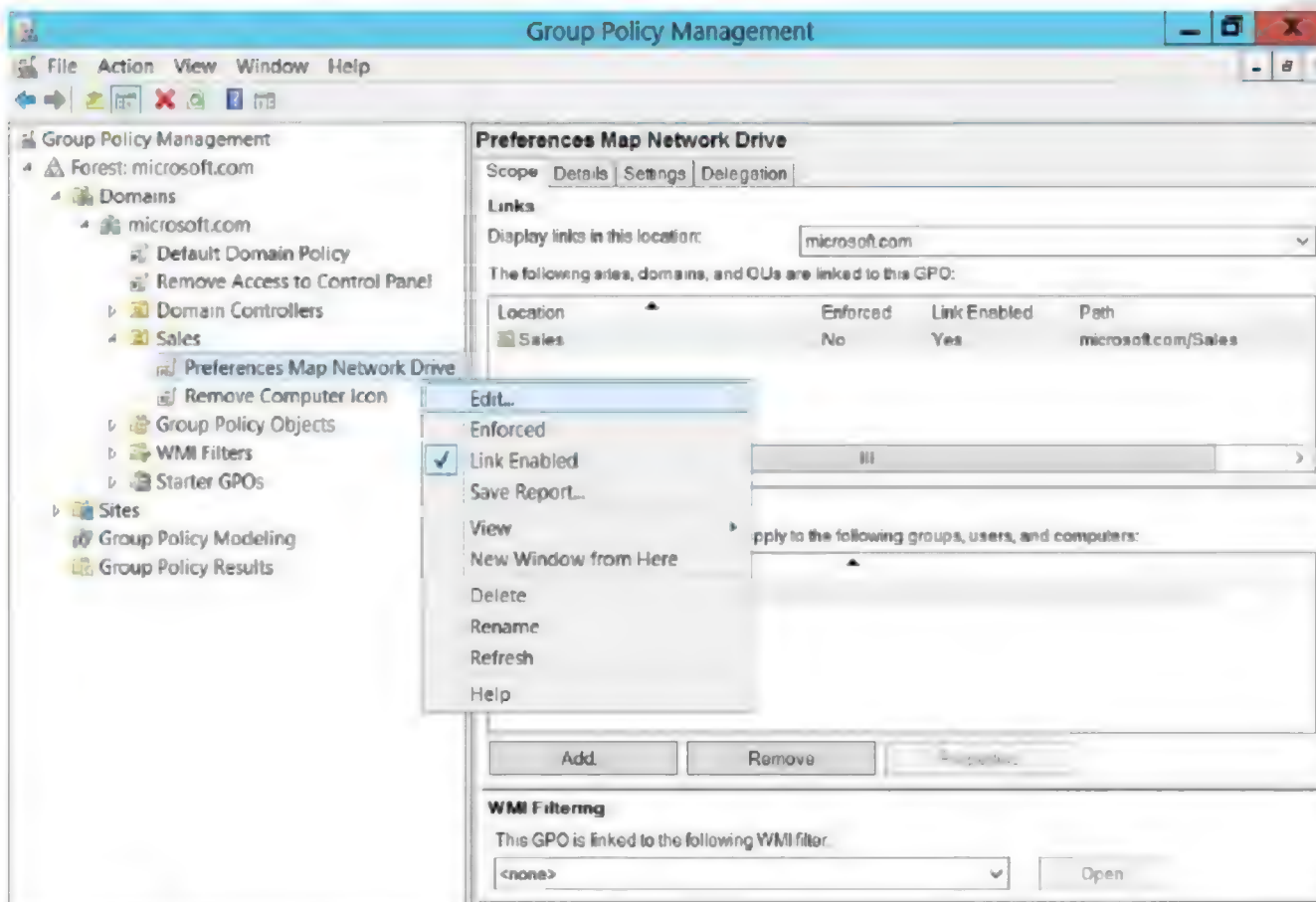




- Enter name (Ex: **Preferences Map Network Drive**) and click **OK**.

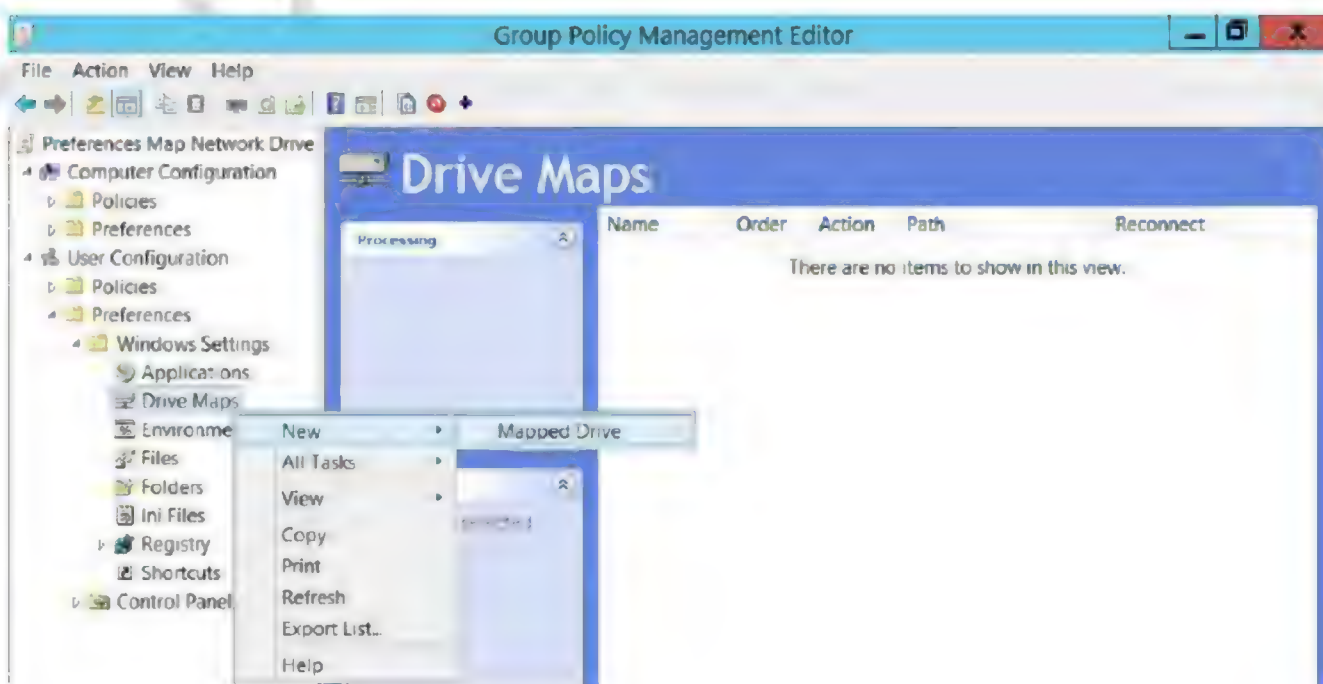


- Right Click created GPO, select **Edit**.



Open the GPO editor

- Expand User configuration → Preferences → Windows Settings → Right click **Drive Maps** → Select **New Mapped Drive**



6. In Action select Create, Enter Location: (\\sys1\userdata), select Drive Letter X:→OK

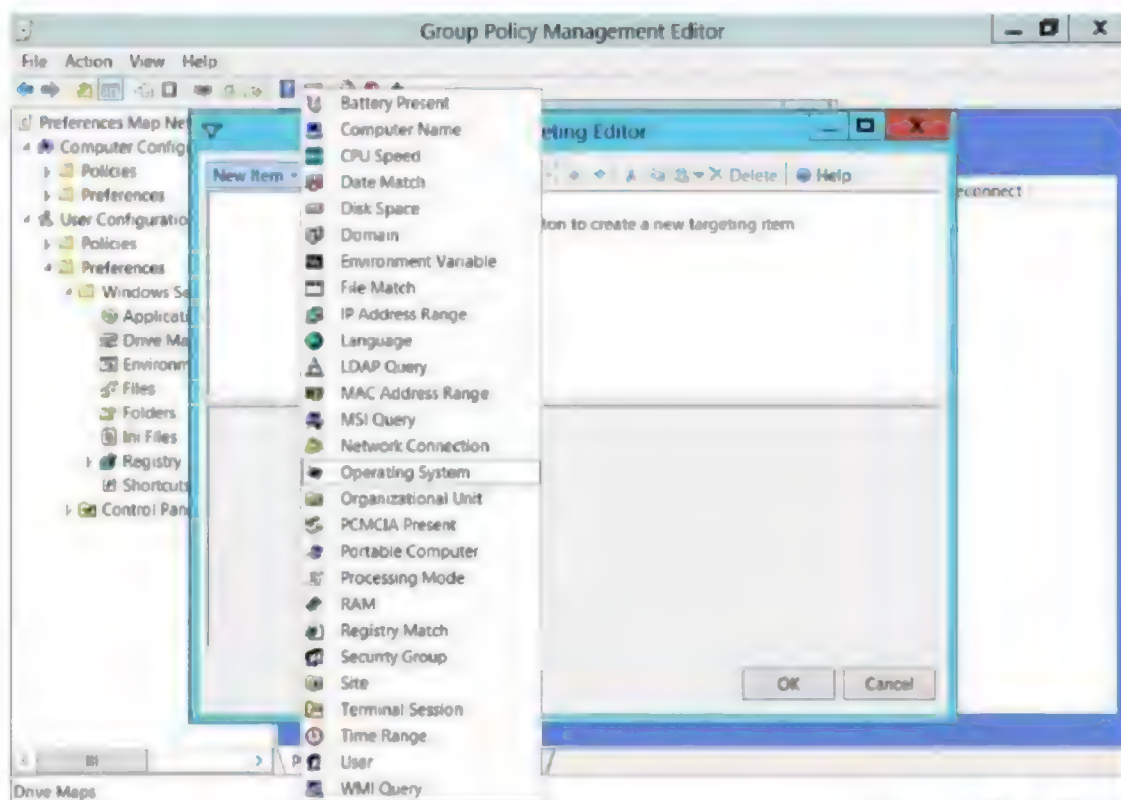


7. Select Common tab and check box Item-level targeting, click **Targeting...**

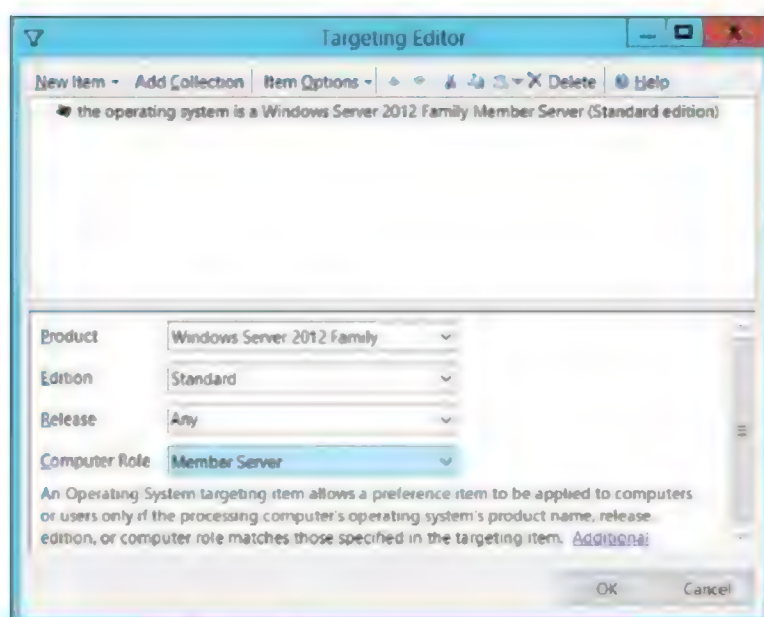




8. Select New Item → select **Operating System**

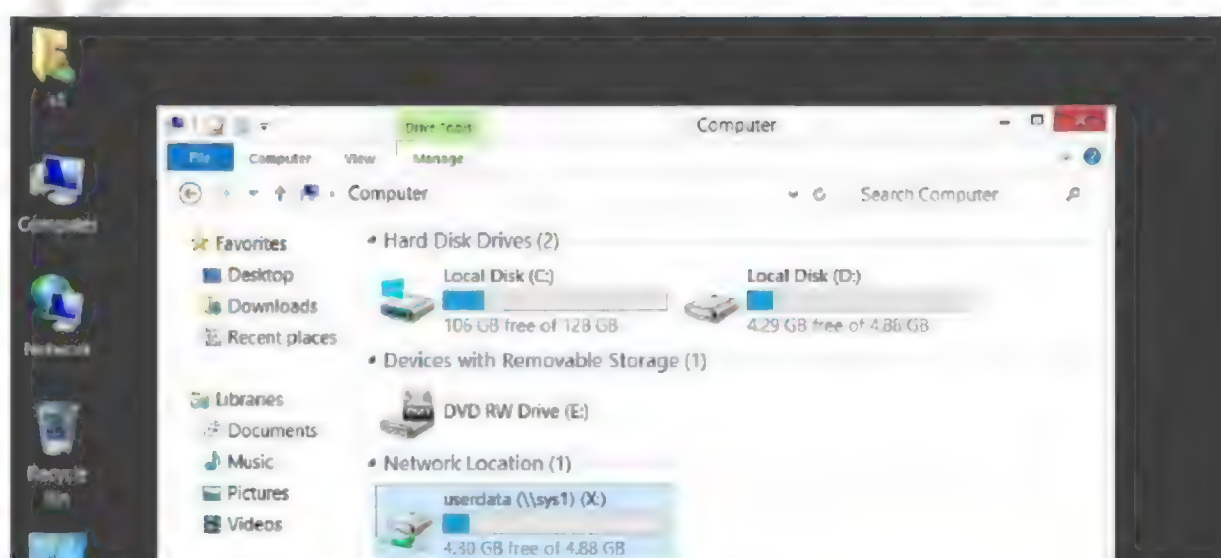


9. Select Product: **WindowsServer2012Family**, Edition: **Standard**, Computer Role: **Member Server**, click **OK**.



### Verification:

1. Login as user (**S1**) to Member Server.





## Lab – 40: Creating Forest Trust

### Objective:

To create trust between two domains so that users from one domain can be authenticated from another

### Pre-requisites:

Before working on this lab, you must have

- A computer running Windows Server 2012 Domain Controller for MICROSOFT.COM.
- A computer running Windows Server 2012 Domain Controller for IBM.COM.

### Topology:



**MICROSOFT.COM**

**IBM.COM**

**SYS1**

**SYS2**

**Domain Controller-MICROSOFT.COM**

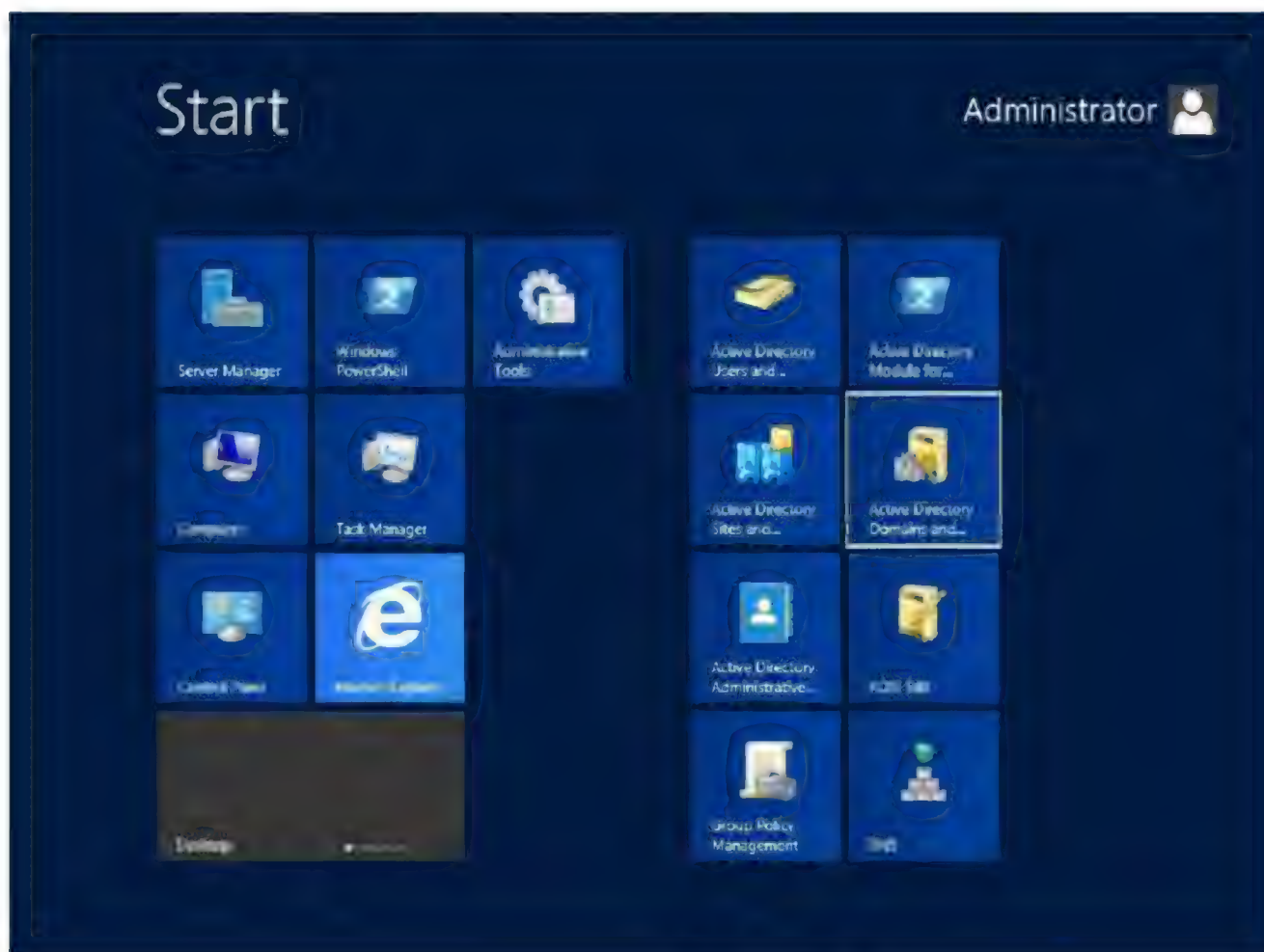
**Domain Controller-IBM.COM**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	10.0.0.2

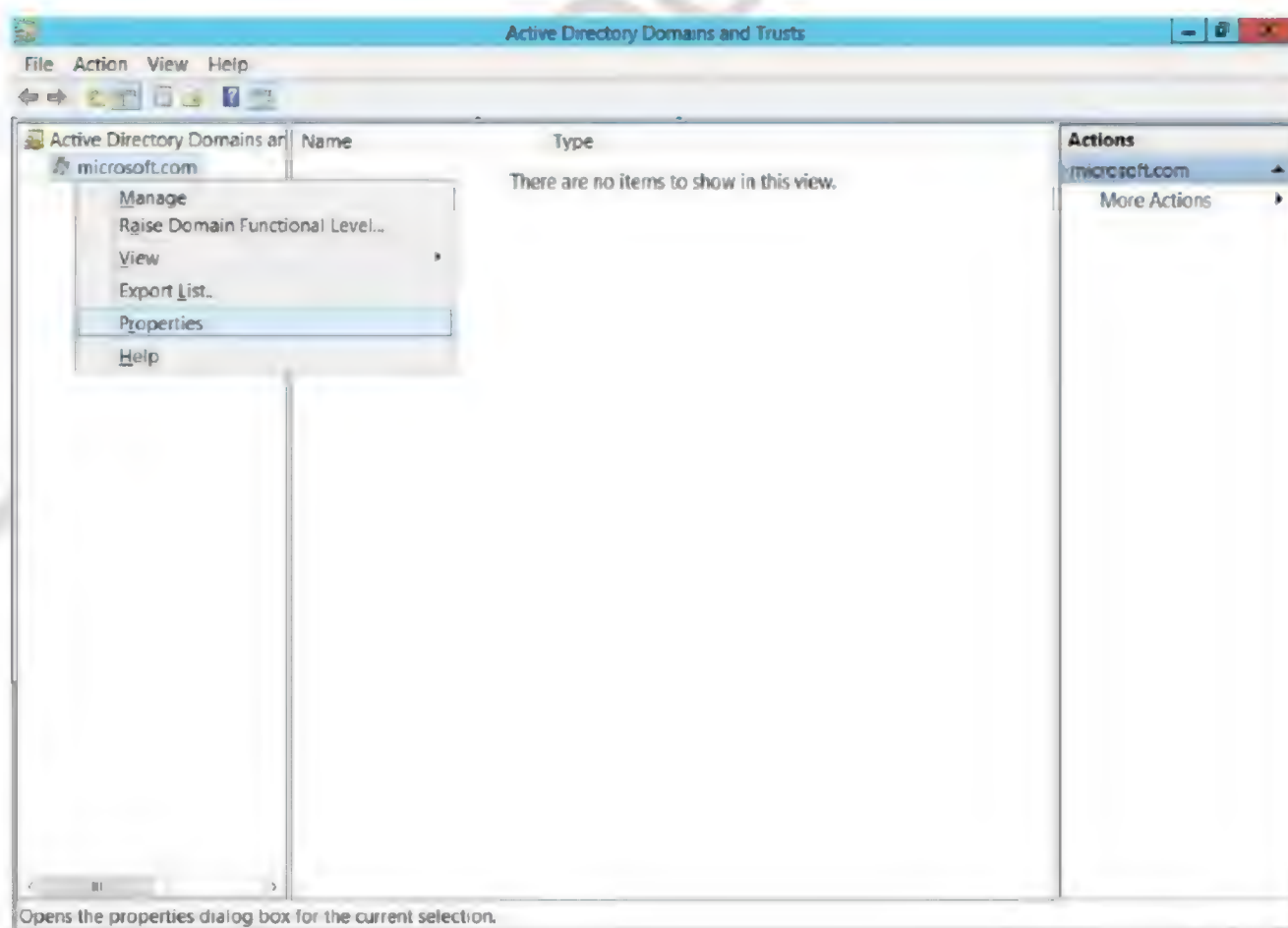
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2
Alternate DNS	10.0.0.1

**Steps:**

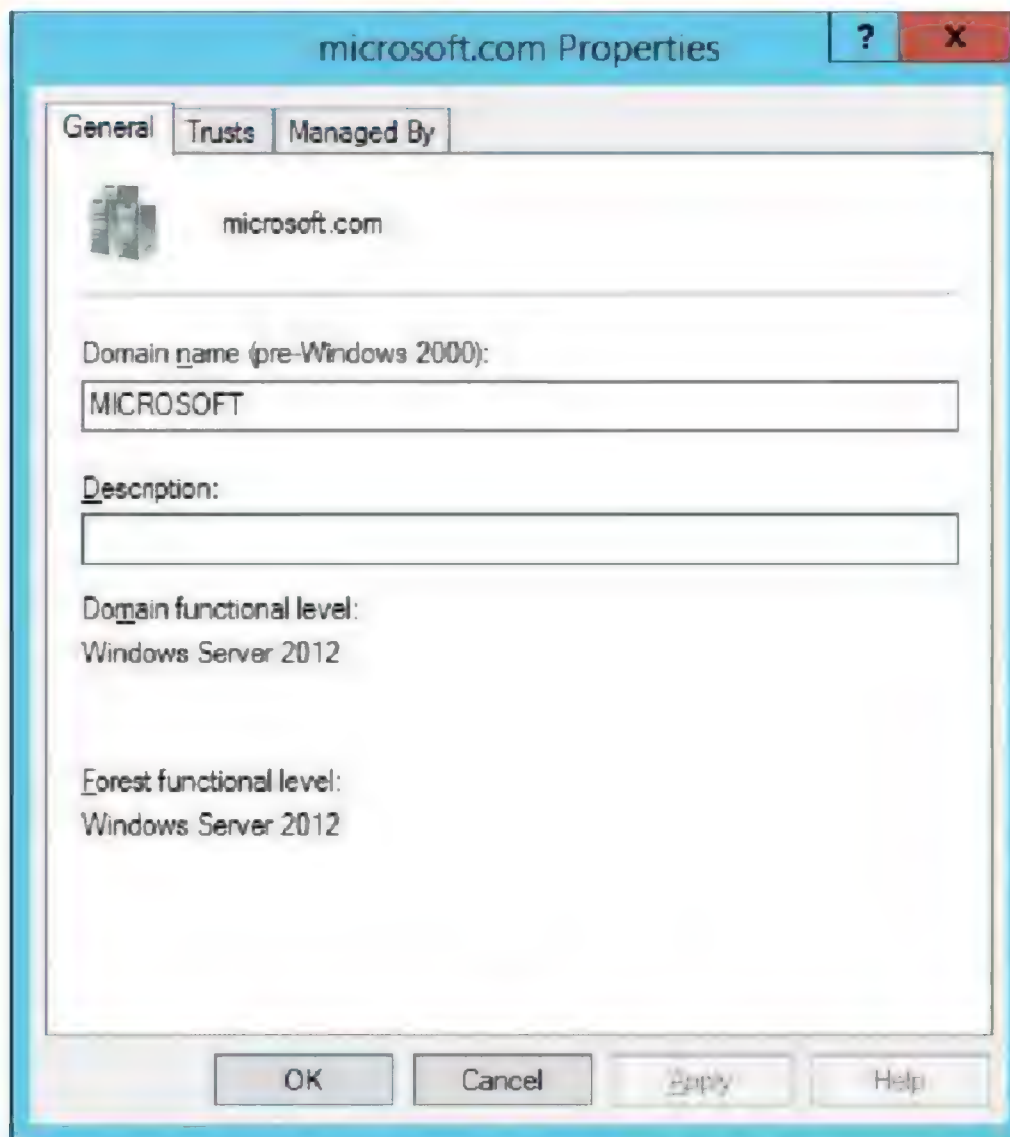
1. Go to **Active Directory Domains and Trusts**,



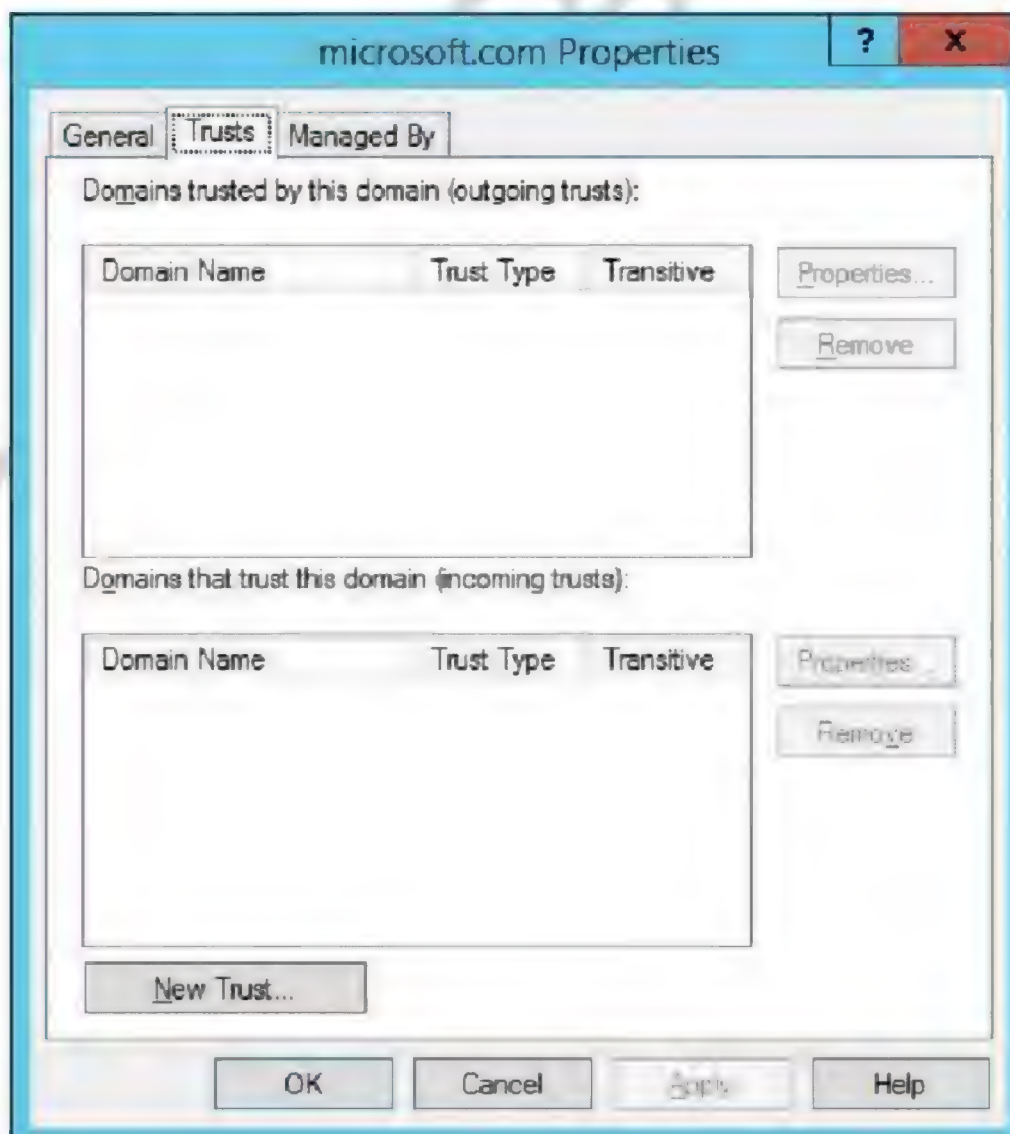
2. Right click the **Domain name** and select **Properties**.



3. Verify Domain and Forest functional level to be Windows Server 2012.

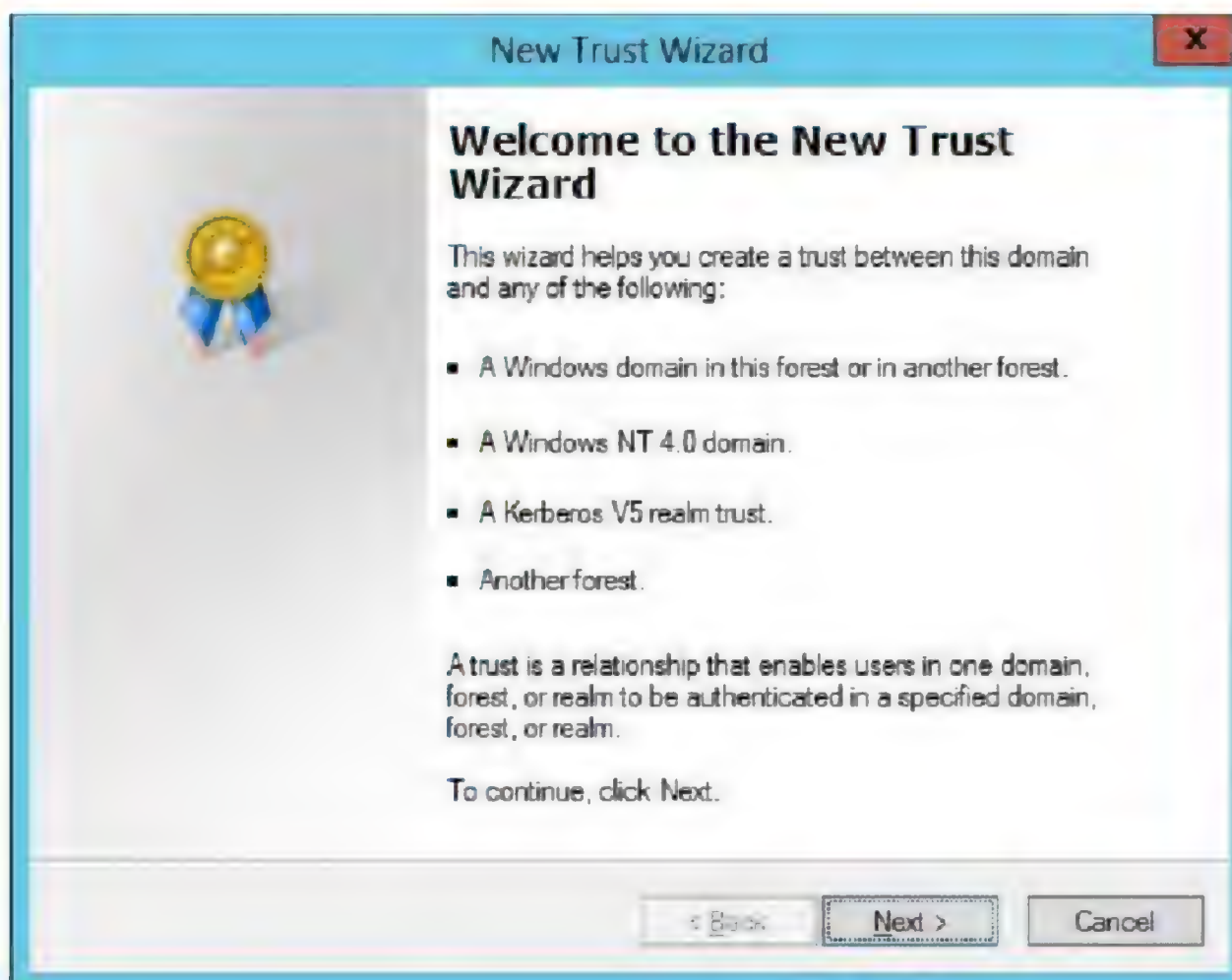


4. Select **Trusts** tab, Click **New Trust**.

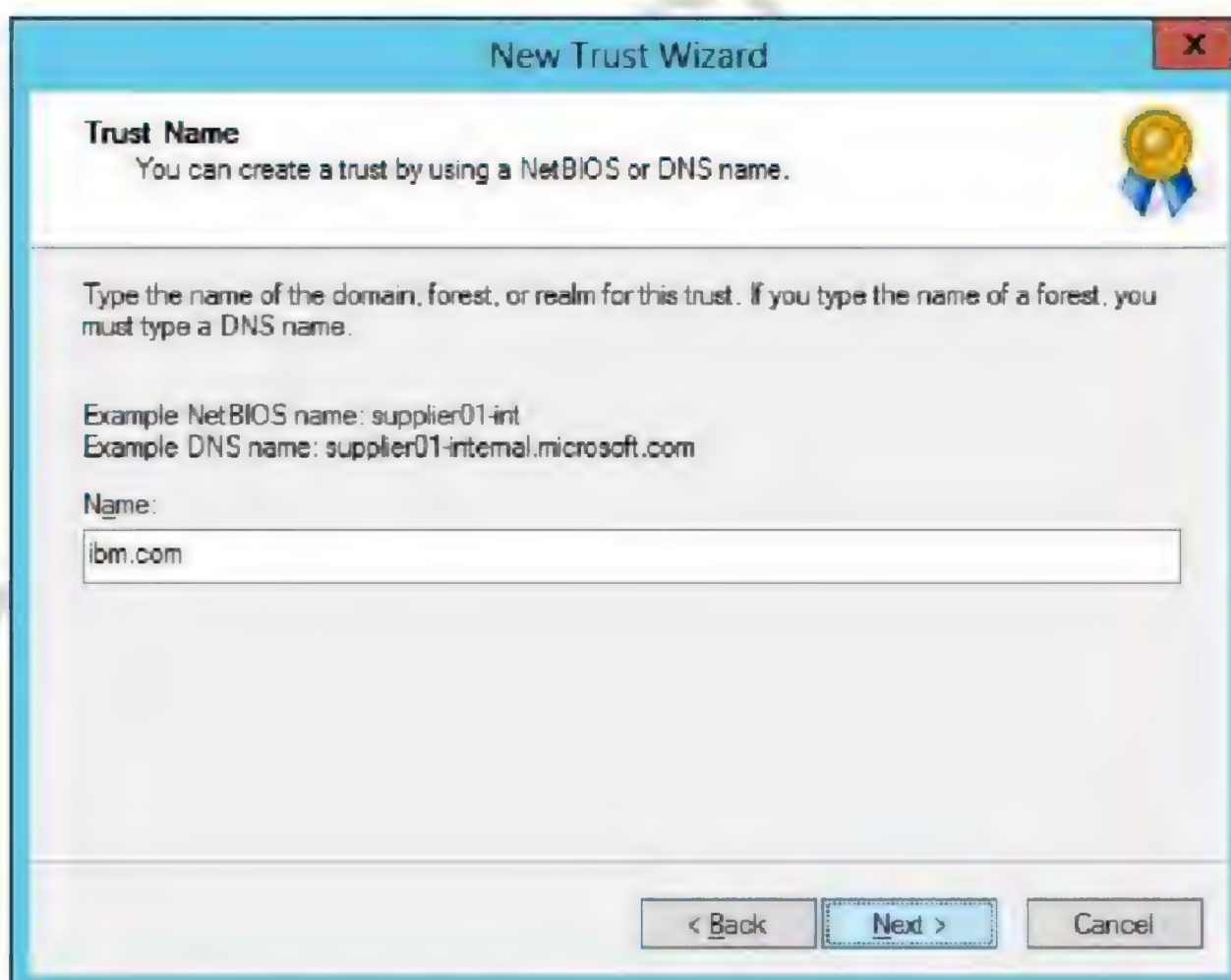




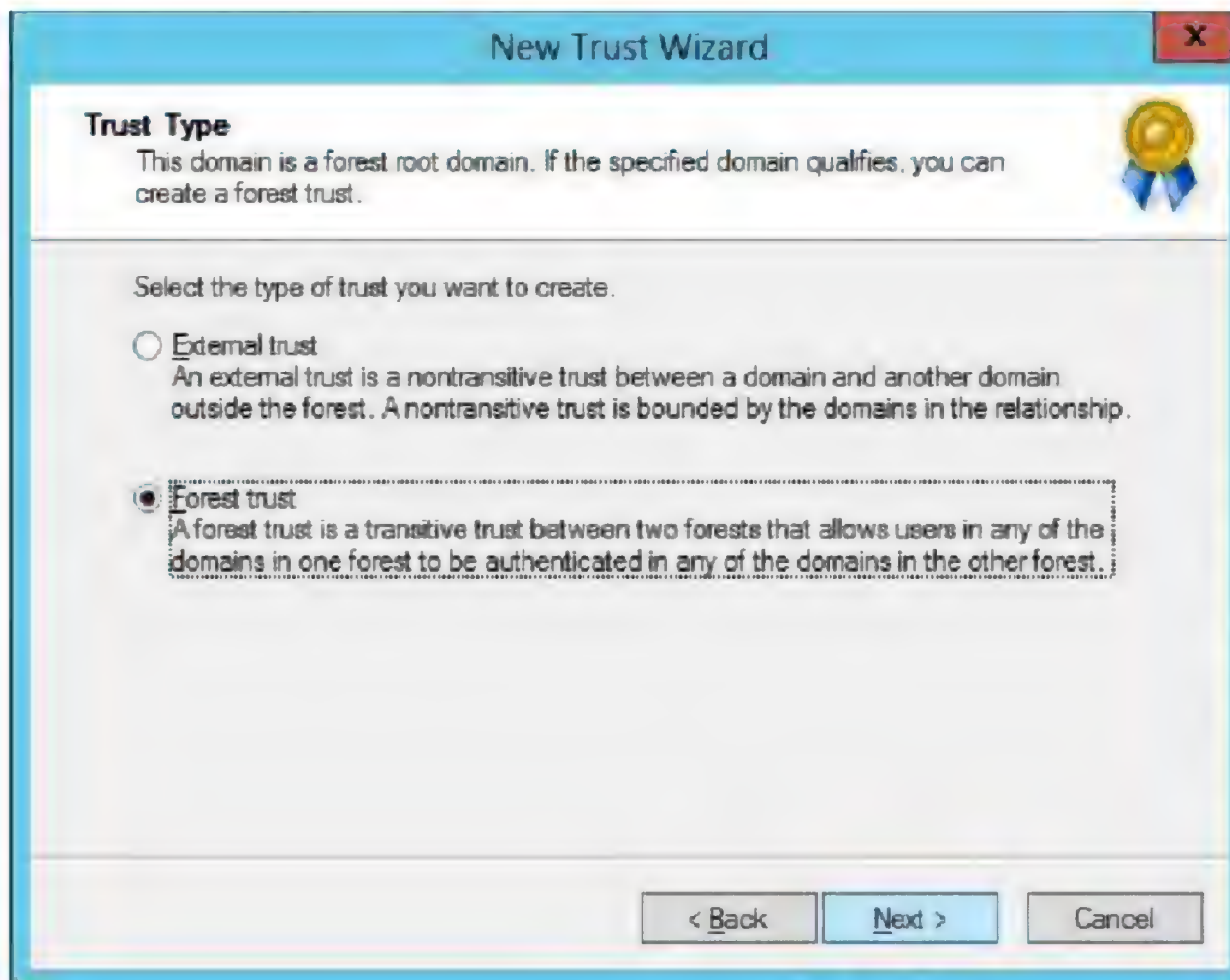
5. On Welcome wizard, click **Next**.



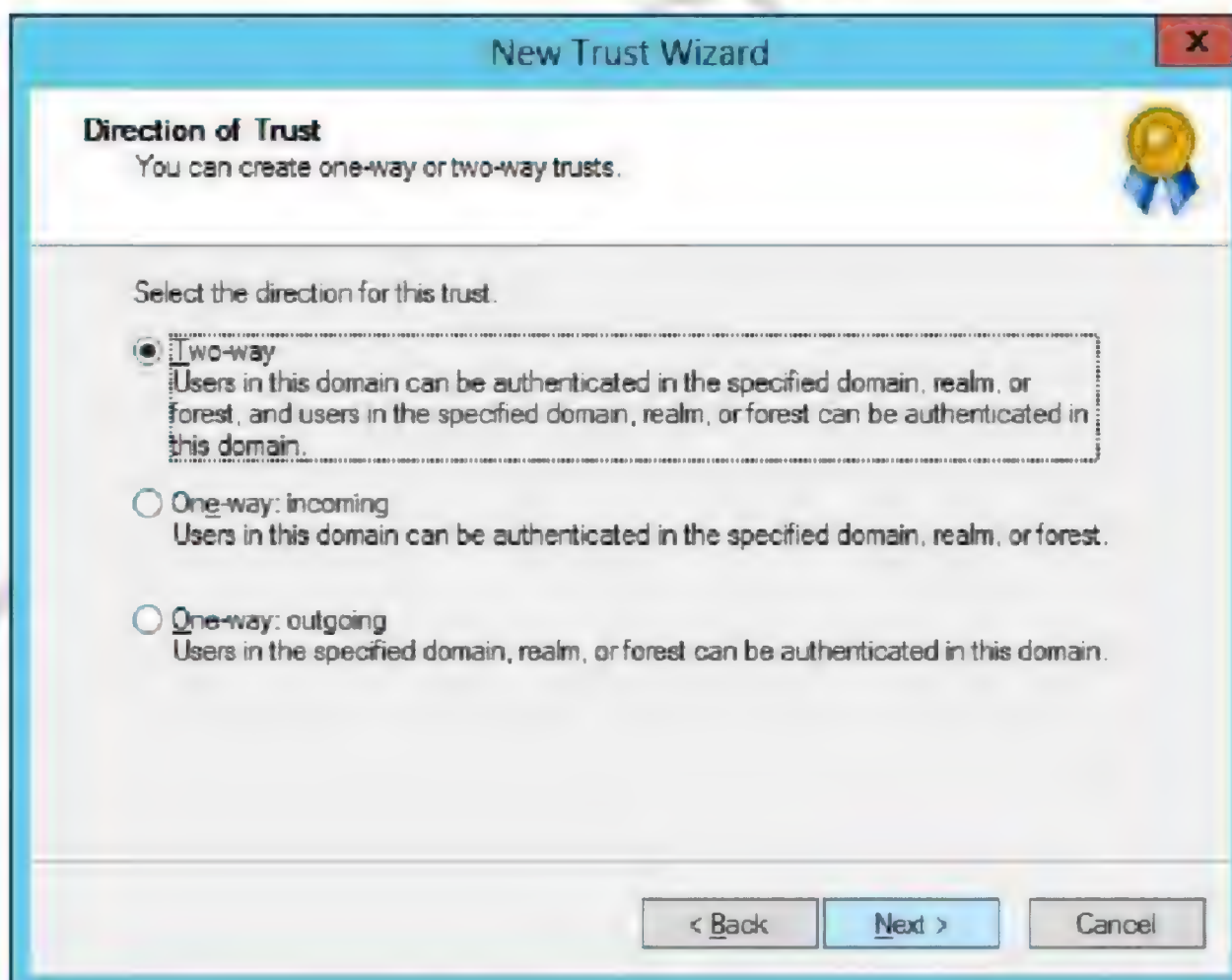
6. In Trust Name, enter name of other Forest **IBM.COM** and click **Next**.



7. Select **Forest trust** and click **Next**



8. Select **Two-way** and click **Next**.





9. Select **Both this domain and the specified domain** and click **Next**.



**New Trust Wizard**

**Sides of Trust**  
If you have appropriate permissions in both domains, you can create both sides of the trust relationship.

To begin using a trust, both sides of the trust relationship must be created. For example, if you create a one-way incoming trust in the local domain, a one-way outgoing trust must also be created in the specified domain before authentication traffic will begin flowing across the trust.

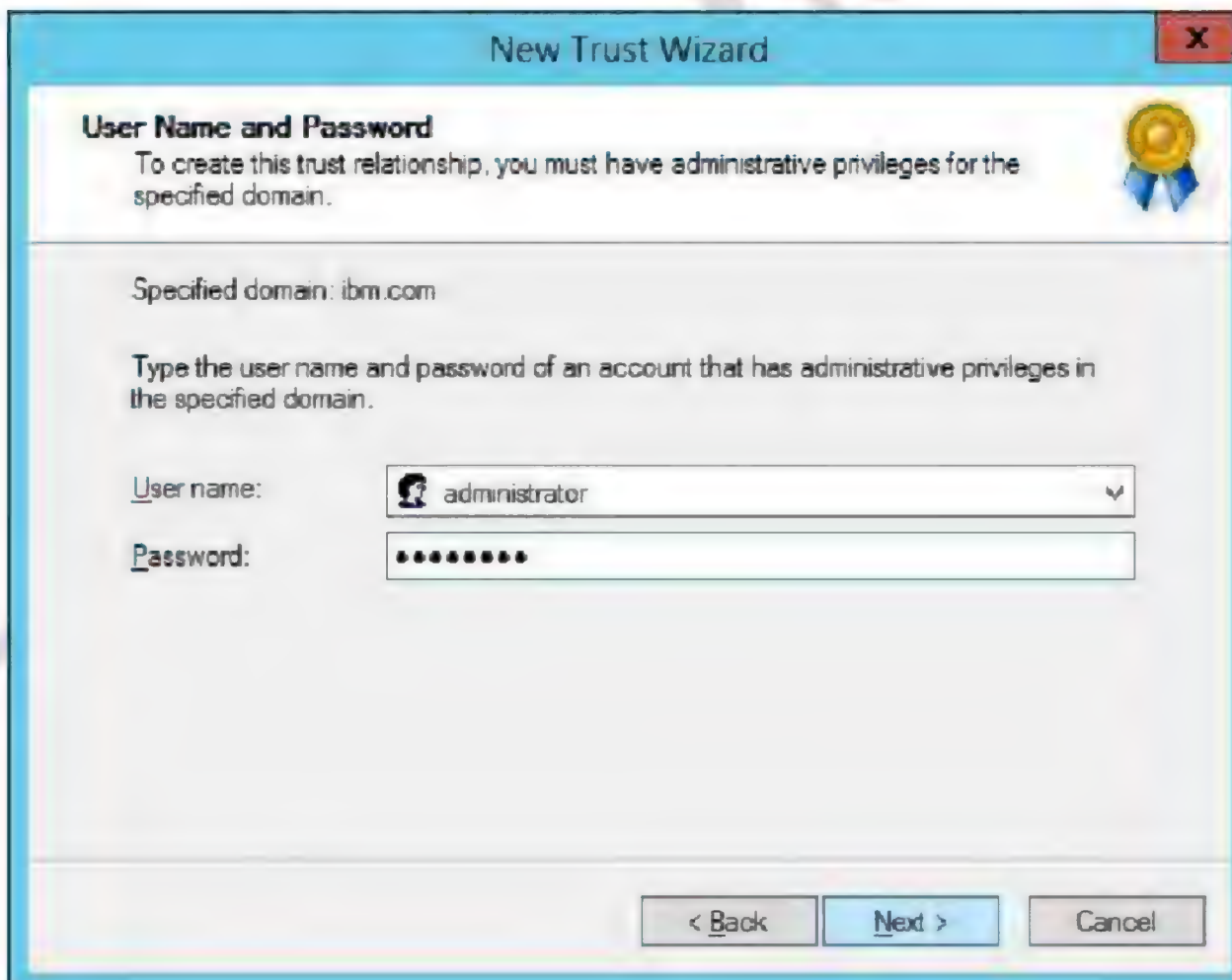
Create the trust for the following:

☐ This domain only  
This option creates the trust relationship in the local domain.

☒ **Both this domain and the specified domain**  
This option creates trust relationships in both the local and the specified domains. You must have trust creation privileges in the specified domain.

< Back   Next >   Cancel

10. Enter **Administrator** and **Password of Specified domain:IBM.COM** and click **Next**



**New Trust Wizard**

**User Name and Password**  
To create this trust relationship, you must have administrative privileges for the specified domain.

Specified domain: ibm.com

Type the user name and password of an account that has administrative privileges in the specified domain.

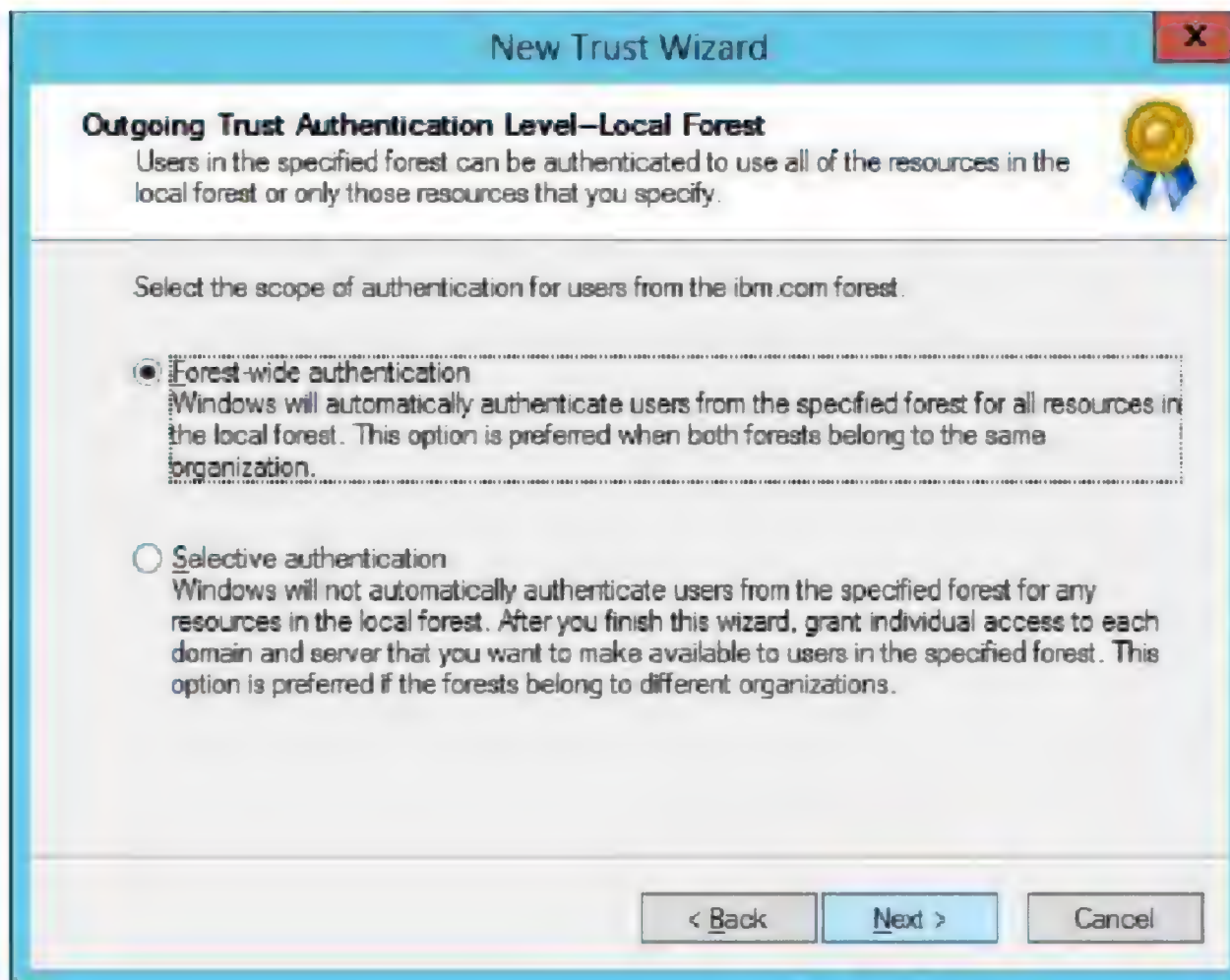
User name: administrator

Password: .....

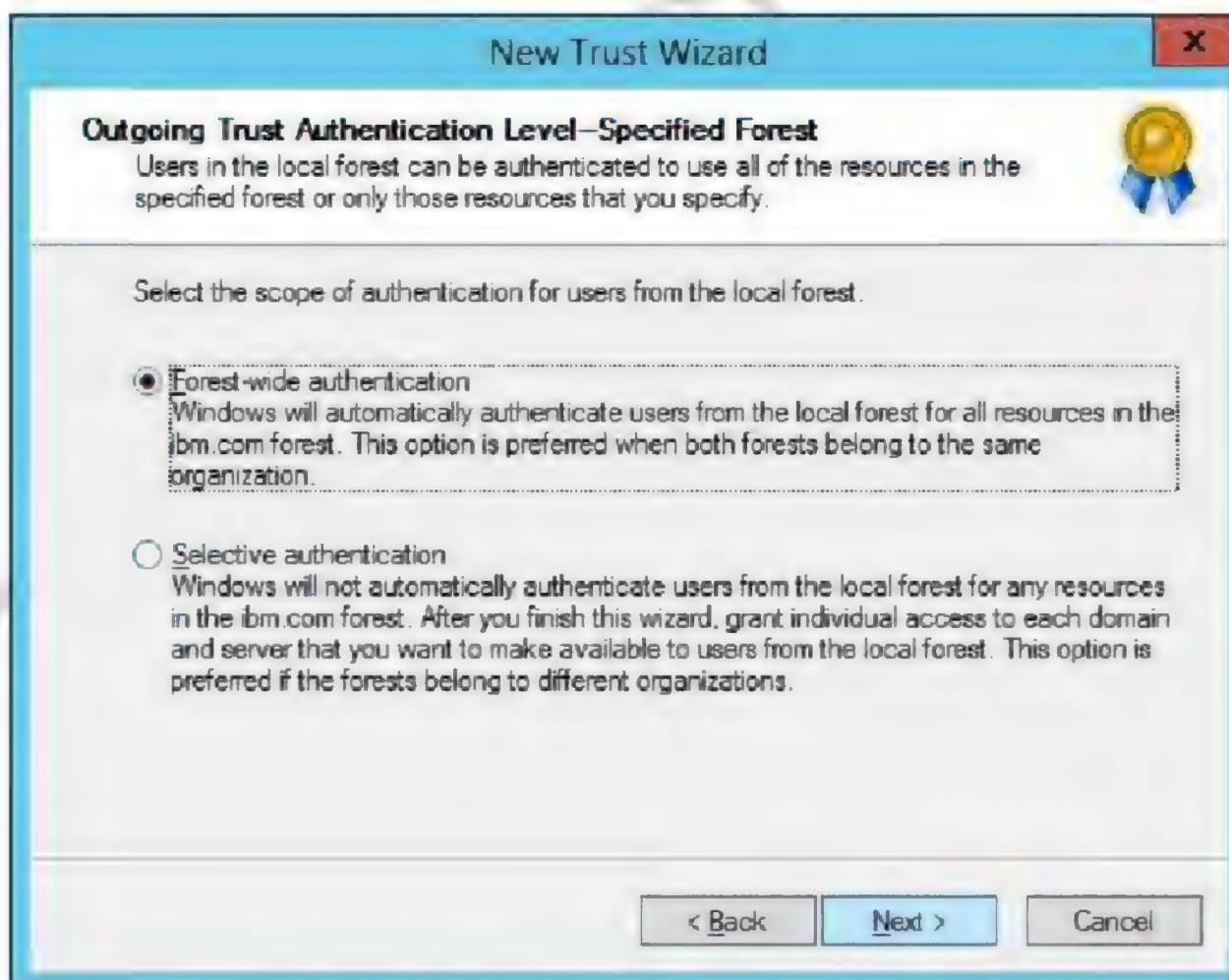
< Back   Next >   Cancel



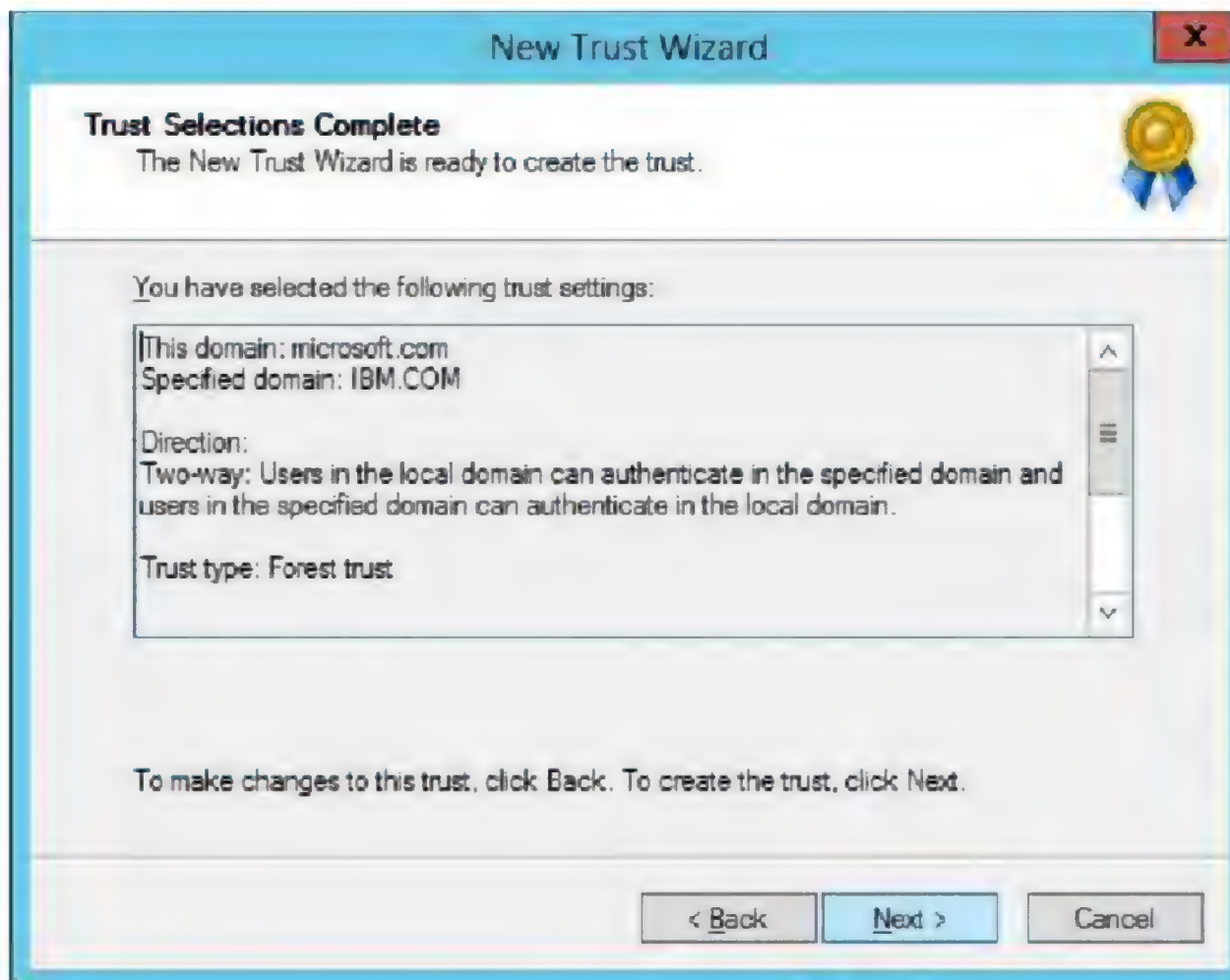
11. Select **Forest-wide authentication** for **Local Forest** and click **Next**.



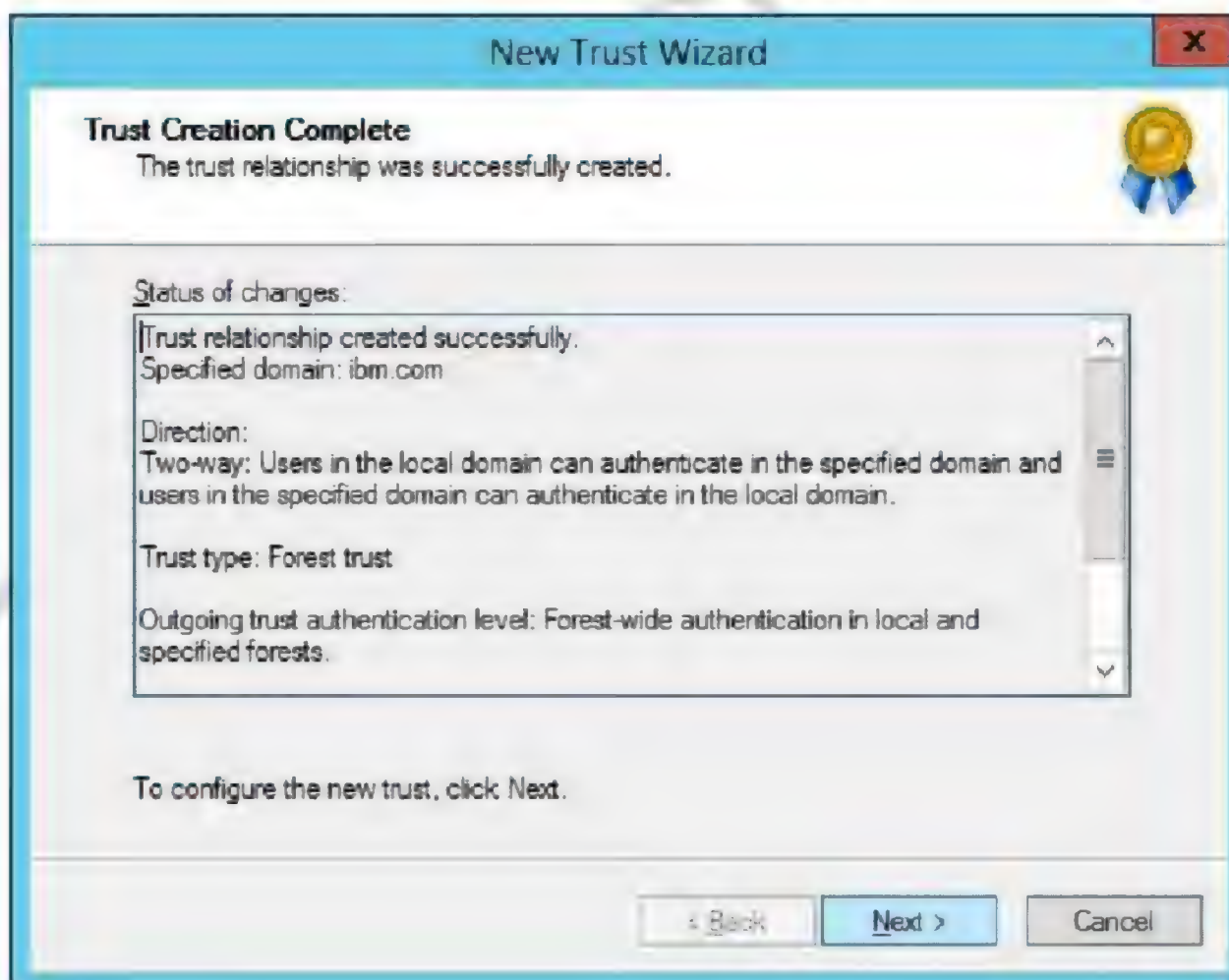
12. Select **Forest-wide authentication** for **Specified Forest** and click **Next**.



13. Verify the **Trust Selections** and click **Next**.

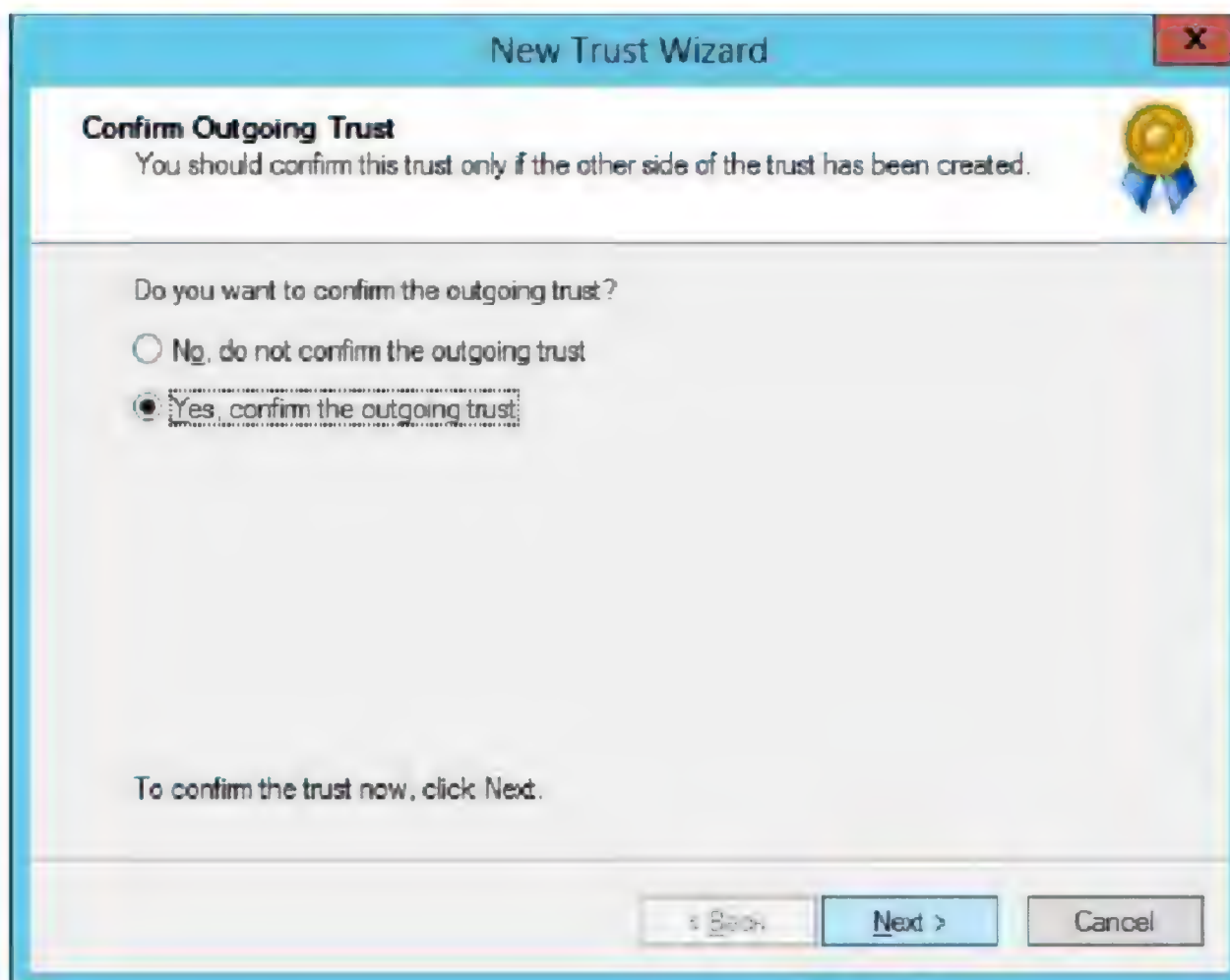


14. Verify the **Summary** and click **Next**.

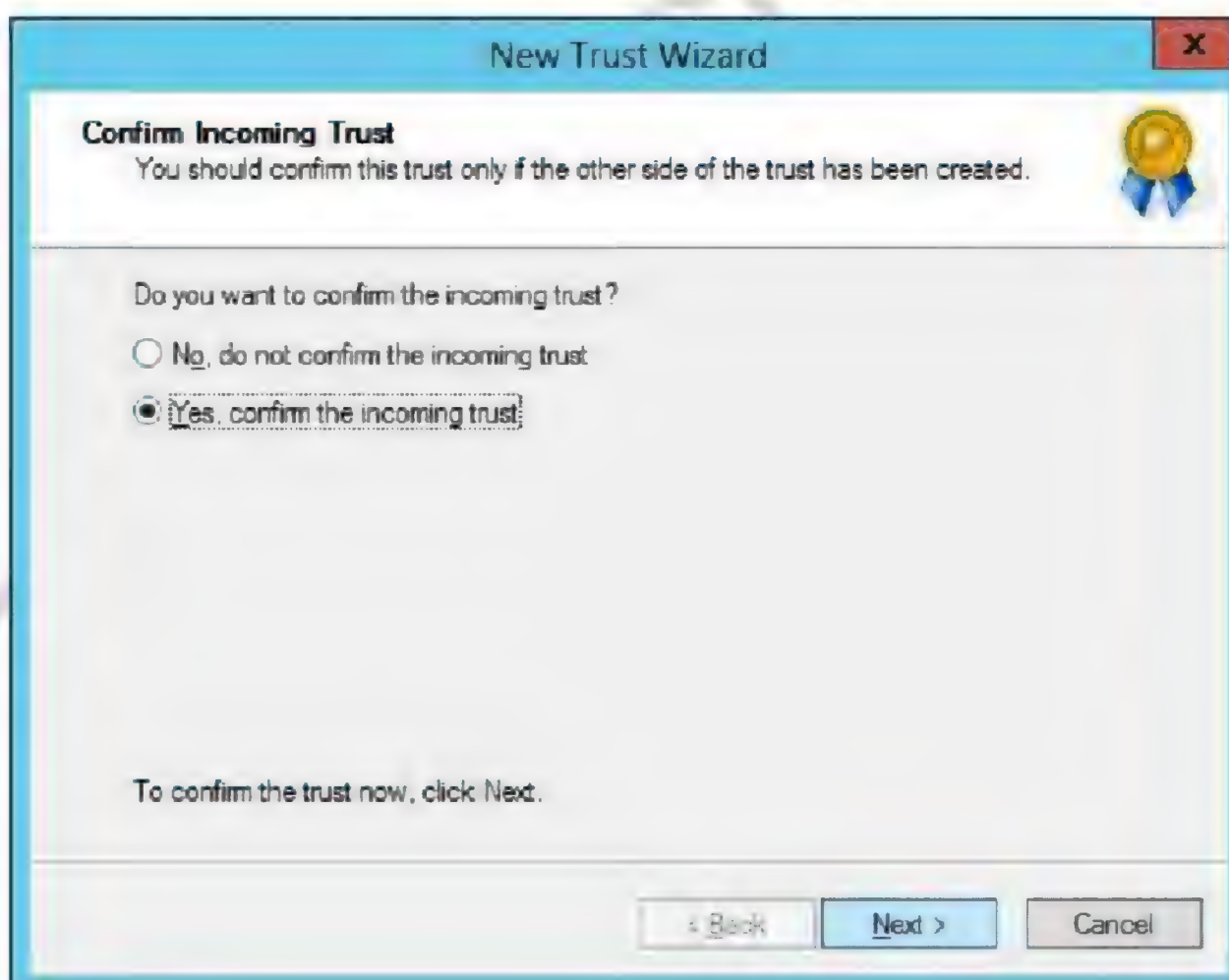




15. Select **Yes, confirm the outgoing trust** and click **Next**.



16. Select **Yes, confirm the incoming trust** and click **Next**.

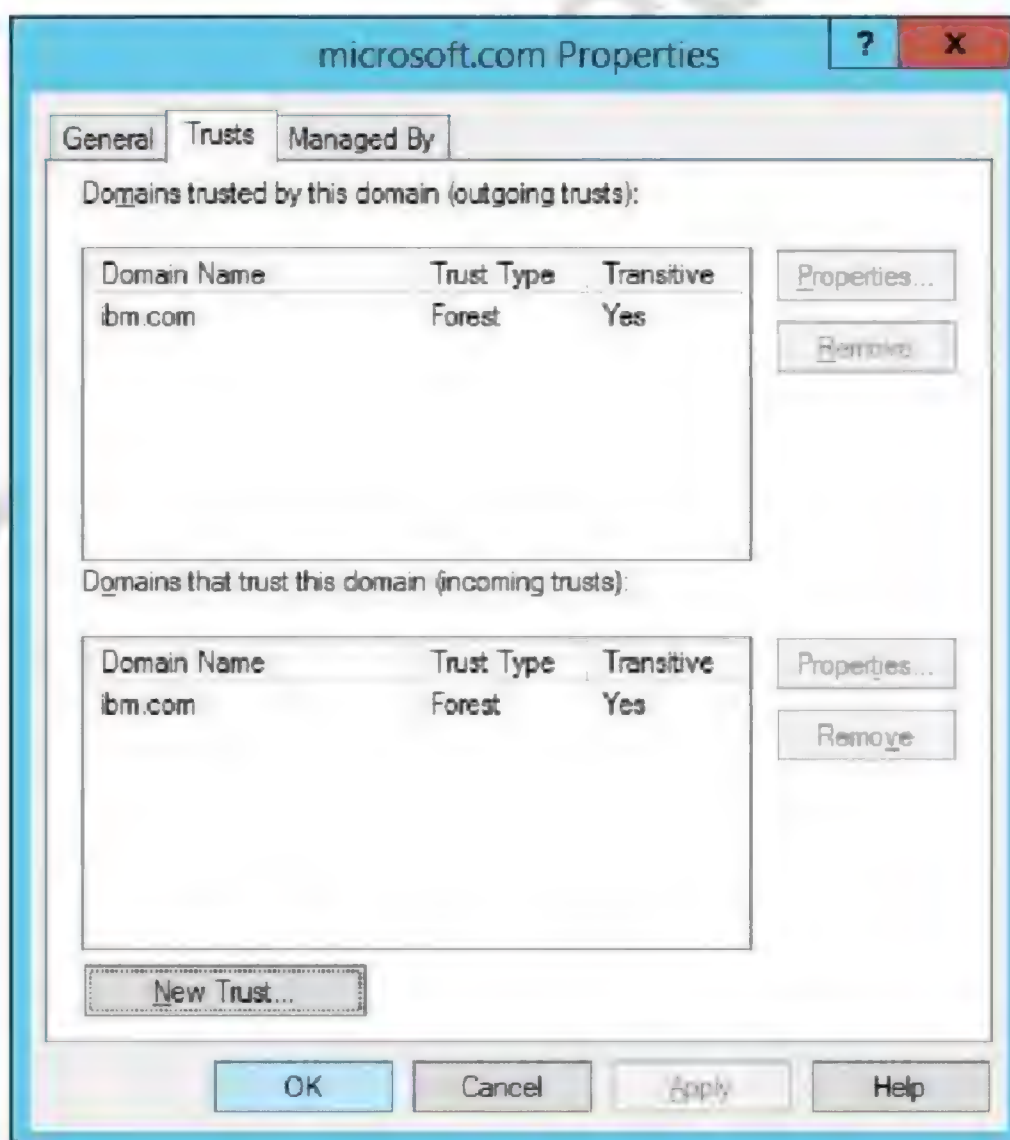




17. Click **Finish**.



18. Check Outgoing and Incoming Trusts and click **OK**.



**Verification:**

1. Try to Logon on to MICROSOFT.COM domain computers or IBM.COM domain computers as other Domain Users.

**Note: By default Users cannot log on to D.C.**

2. Log in as MICROSOFT Administrator to MICROSOFT.COM D.C and allow IBM users to log on to D.C using **Domain Controller Security Policy** in **Group Policy Management.(Allow Logon Locally Policy)**
3. Similarly allow MICROSOFT.COM users to log on to IBM.COM D.C using Domain Controller Security Policy of IBM.COM D.C.



## Lab – 41: Active Directory Recycle Bin

**Objective:**

To enable active directory recycle bin for restoring deleted objects in AD

**Pre-requisites:**

Before working on this lab, you must have

- A computer running Windows Server 2012 Domain Controller.

**Topology:**

**MICROSOFT.COM**

**SYS1**

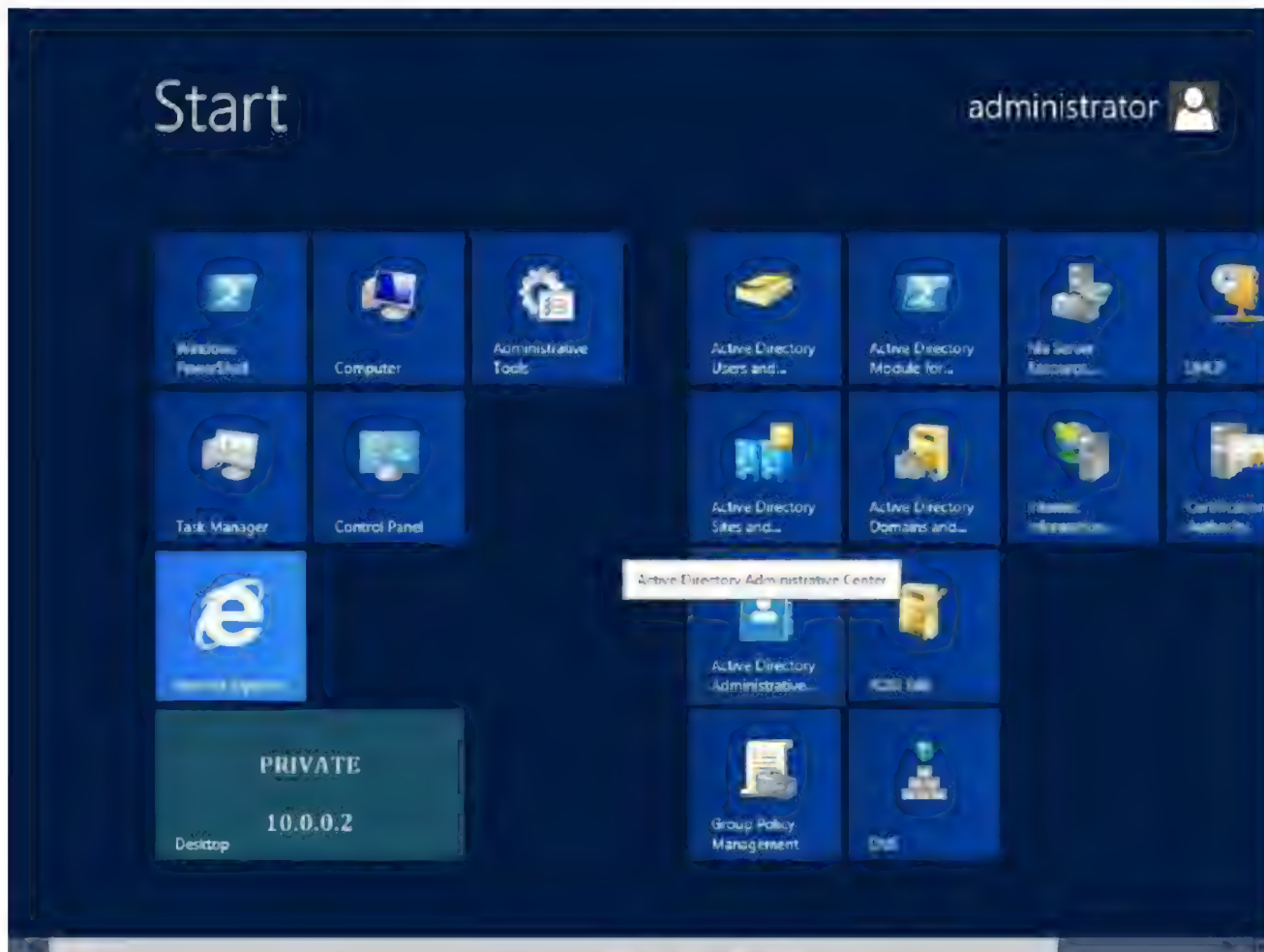
**Domain Controller-MICROSOFT.COM**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

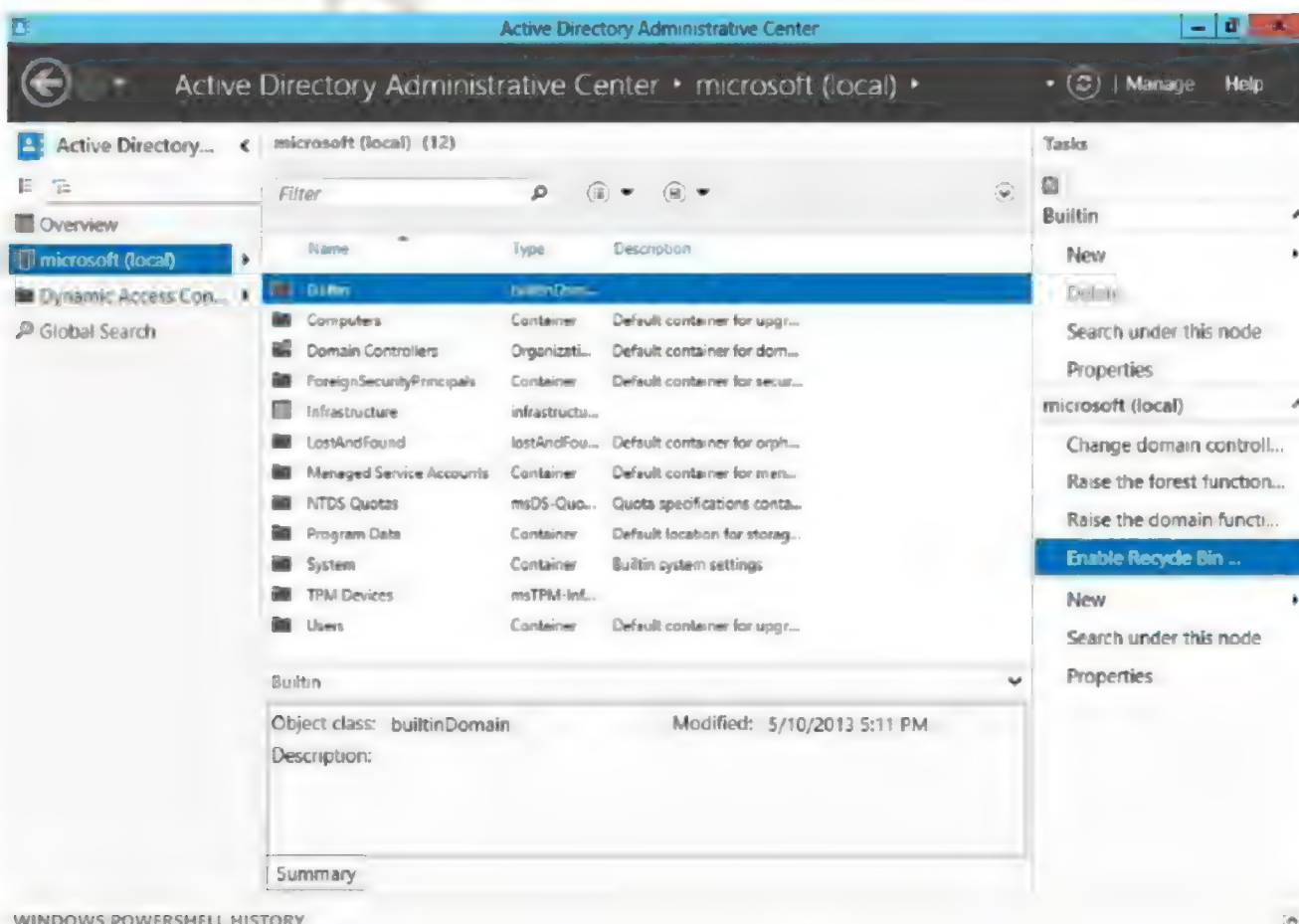


**Steps:**

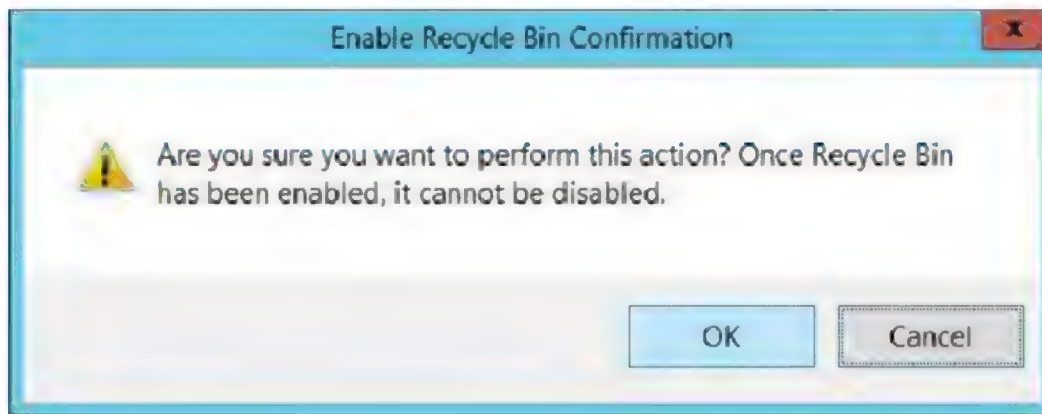
1. Log in as Administrator to the Domain Controller (SYS1).
2. Go to Start, select **Active Directory Administrative Center**.



3. In Active Directory Administrative Center, select Microsoft (Local), Click Raise Domain Functional Level, select Windows Server 2012.
4. Click Raise Forest Functional Level, select Windows Server 2012 and refresh.
5. Click Enable Recycle Bin



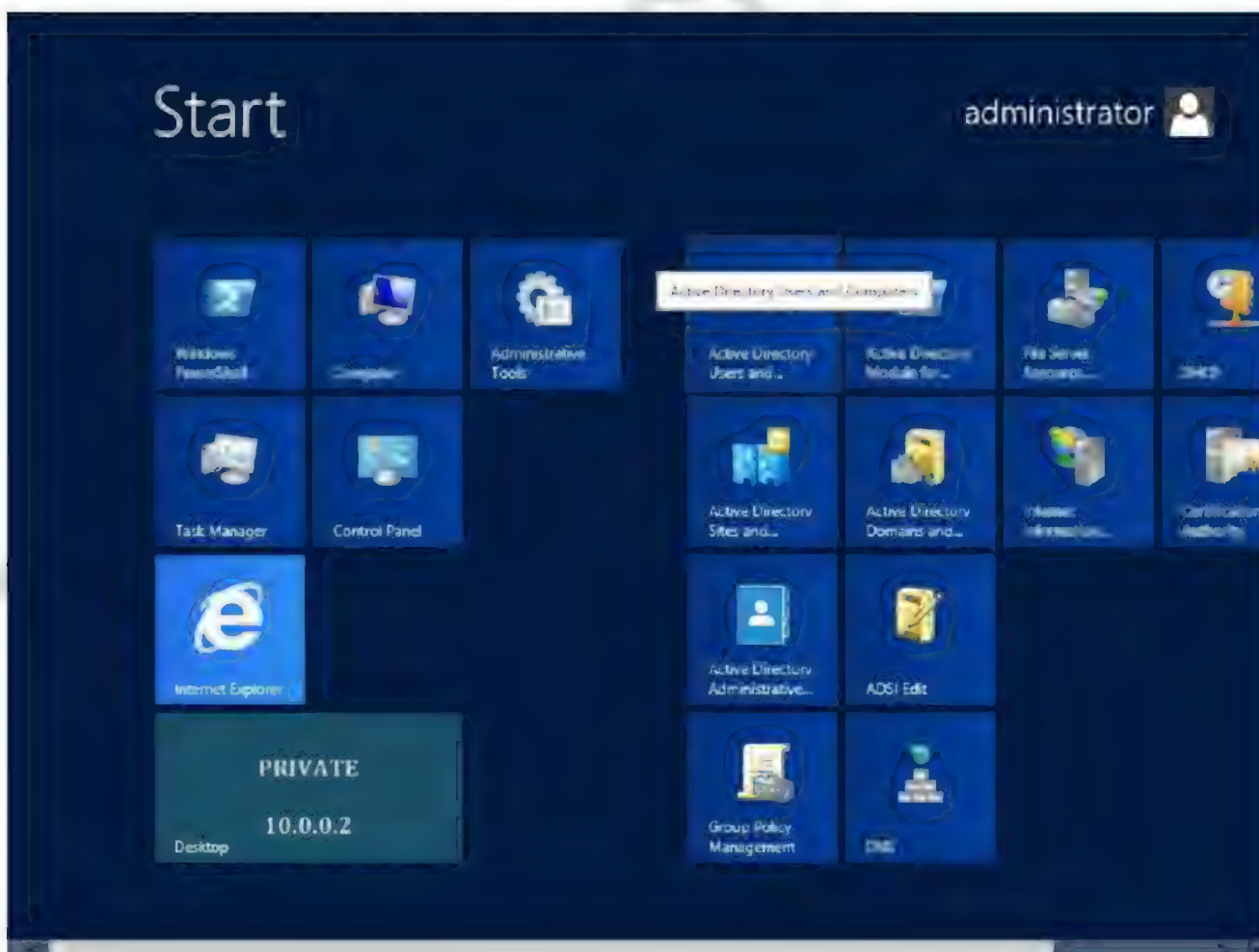
6. Click **OK** to confirm the Enable Recycle Bin feature.



7. Click **OK**, and Refresh Active Directory Administrative Center now.

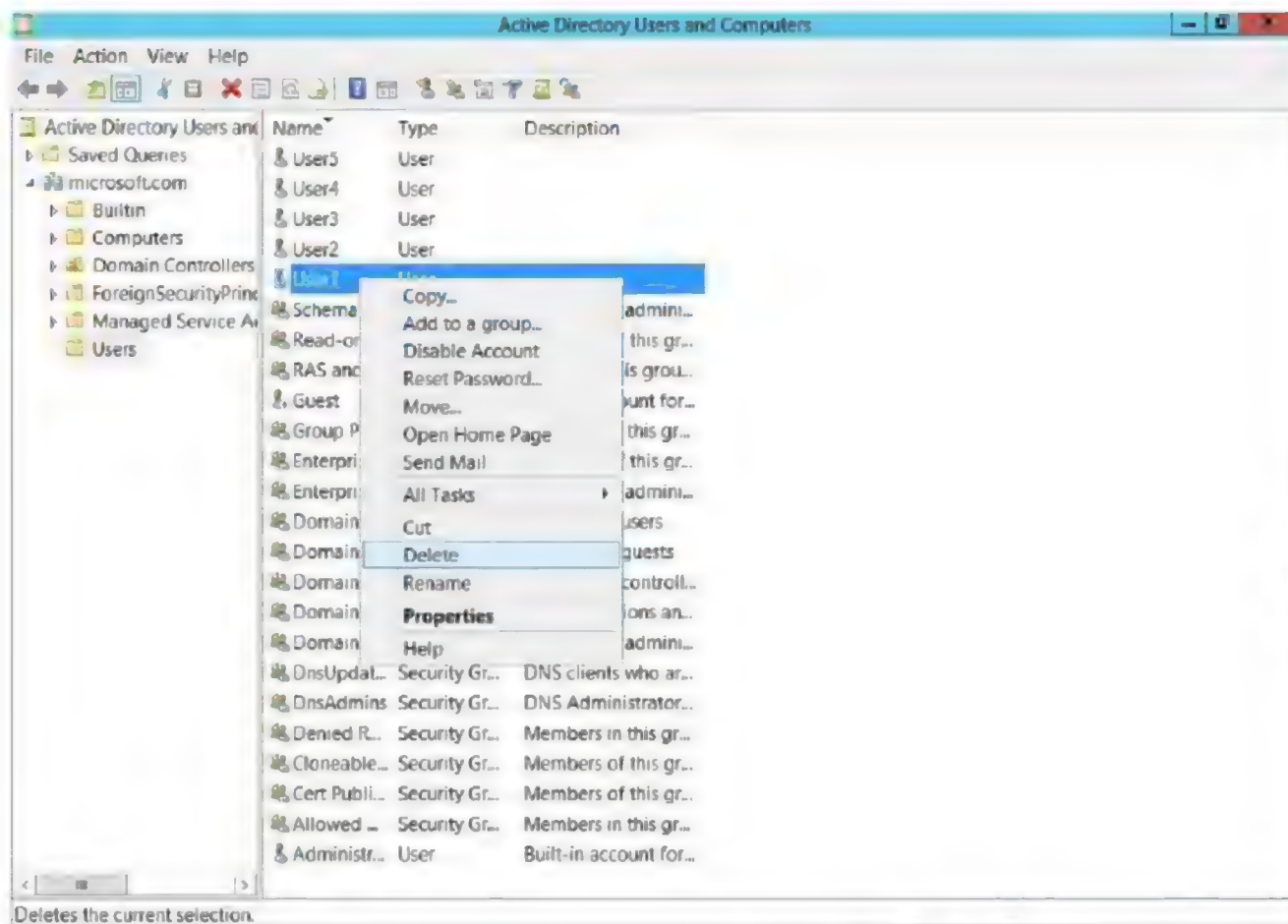


8. Go to Start, select **Active Directory Users and Computers**.

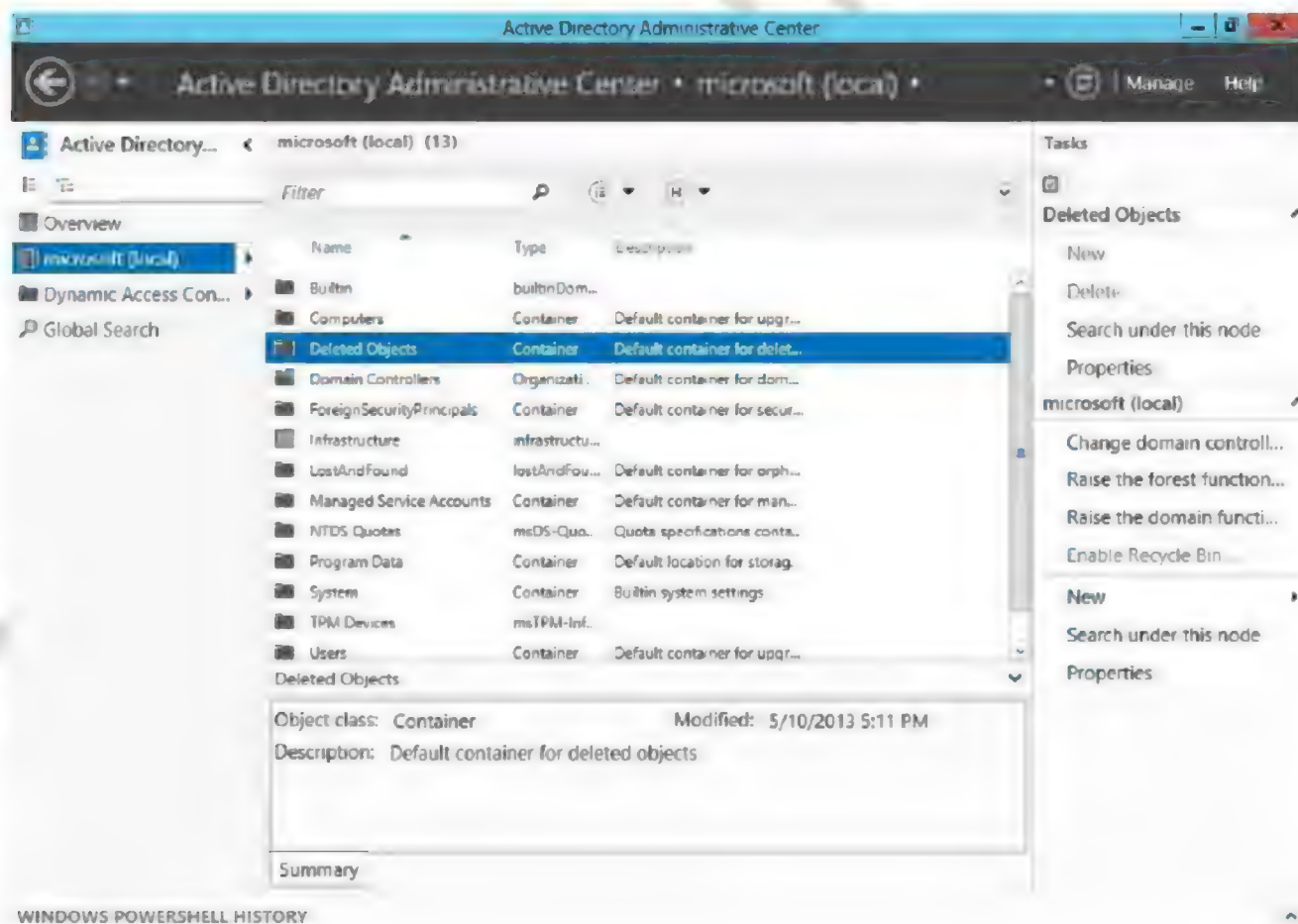




9. Right click User (User1) and select **Delete**, click **Yes** to confirm the deletion.

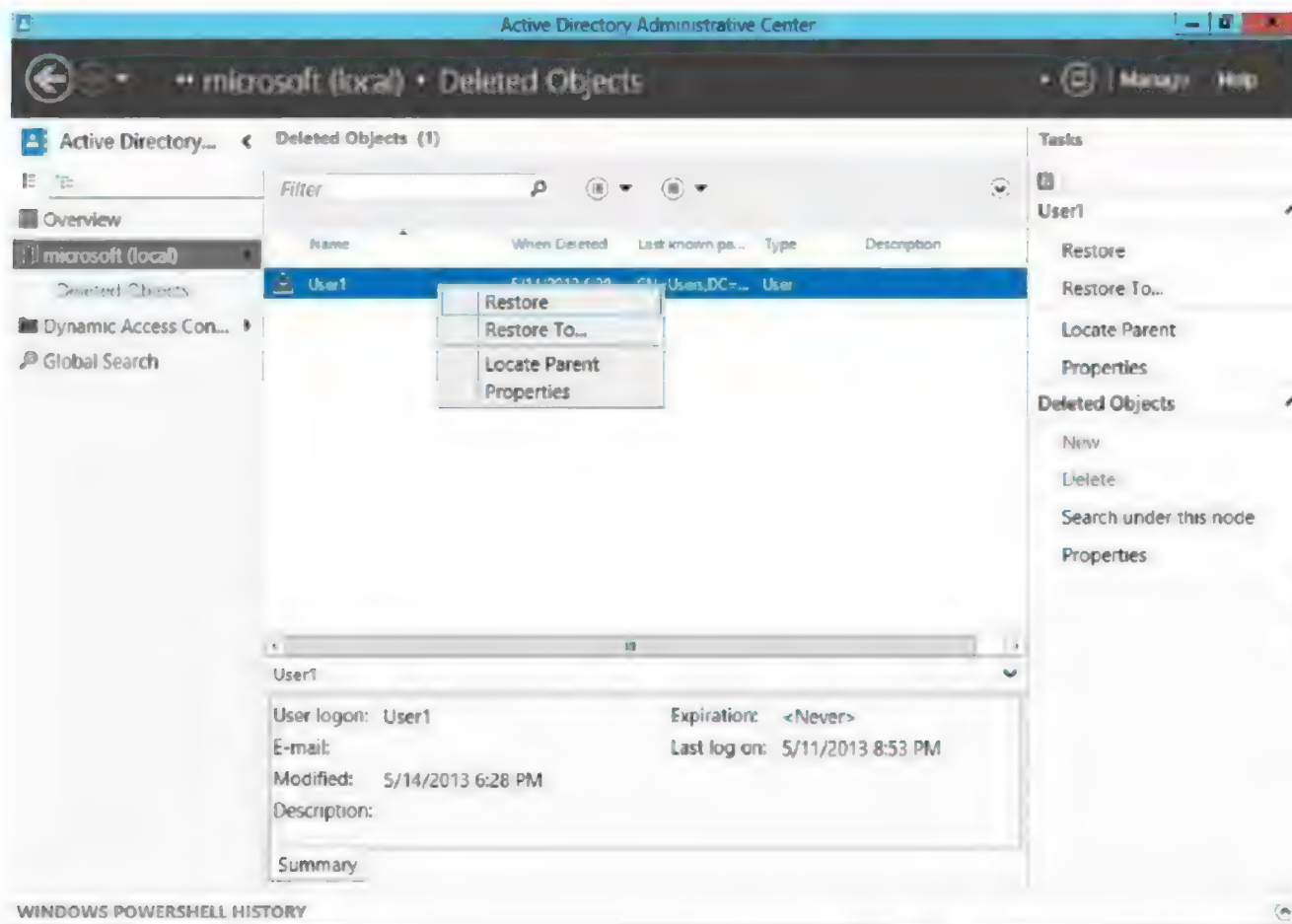


10. Go to Active Directory Administrative Center, select Microsoft (local), **Deleted Objects** Container



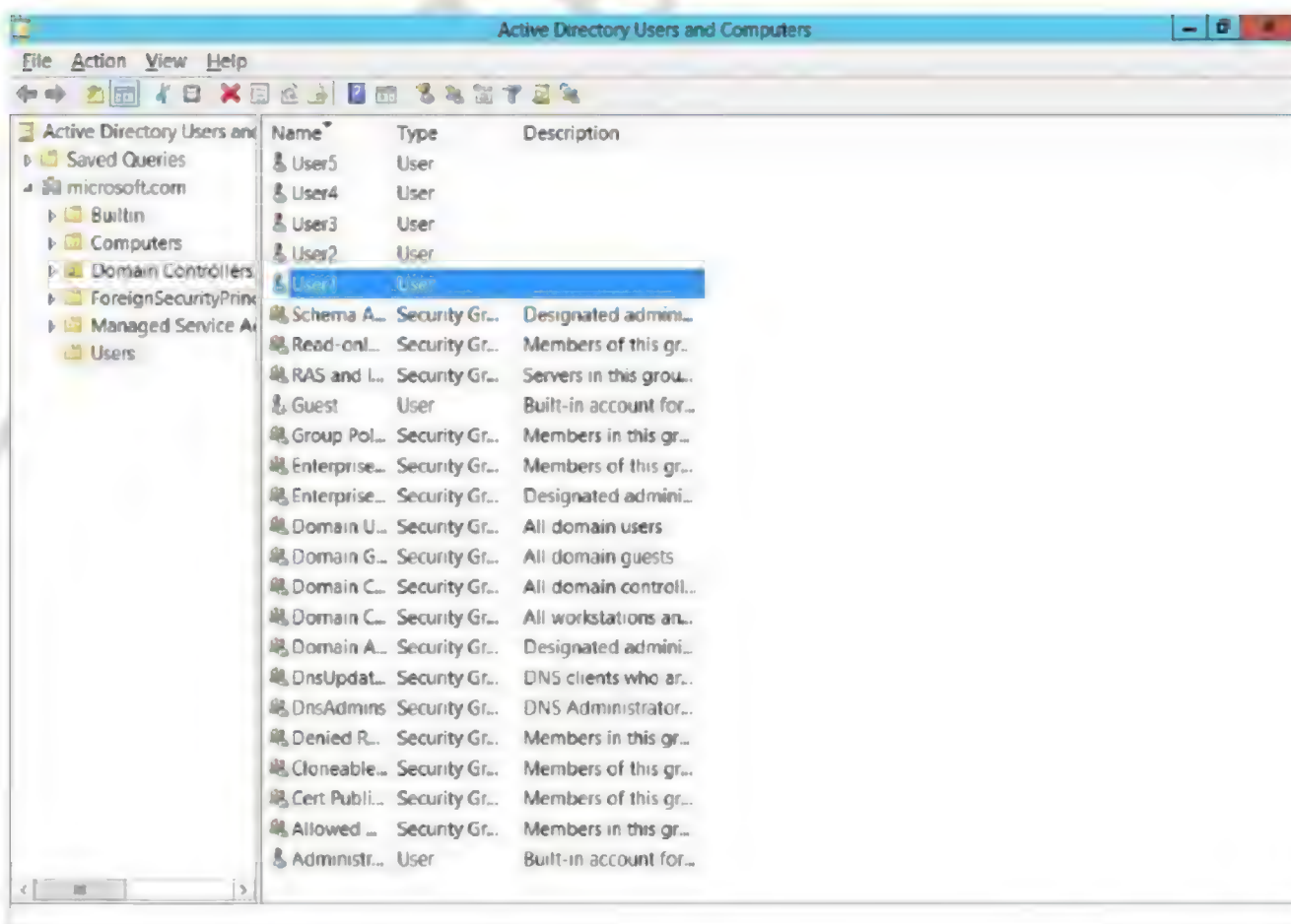


11. Select the User account (User1) to be restored, right click and select **Restore**.



### Verification:

1. Go to Start, Select Active Directory Users and Computers, and verify for the restored user account.



## Lab – 42: Verifying Global Catalog Server

**Objective:**

To verify global catalog server

**Pre-requisites:**

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.

**Topology:**

MICROSOFT.COM

**SYS1**

**Domain Controller**

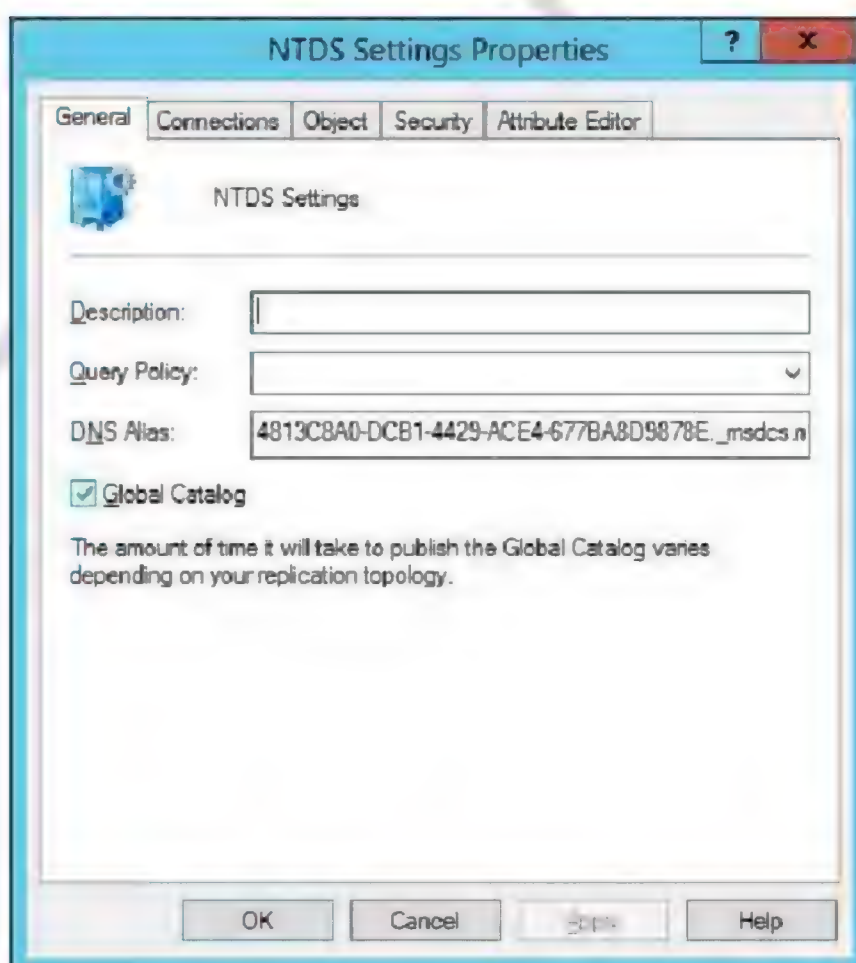
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to **Active Directory Sites and Services**.



2. Expand the Sites → Default-First-Site-Name → Servers → Server Names → **NTDS Settings**.
3. Right click **NTDS Setting** and **Properties**, If the checkbox **Global Catalog** is checked, then it is a **Global Catalog Server**.





## Lab – 43: Creating Active Directory Sites

**Objective:**

To create active directory sites to manage servers in branches

**Pre-requisites:**

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.

**Topology:**

MICROSOFT.COM

**SYS1**

**Domain Controller**

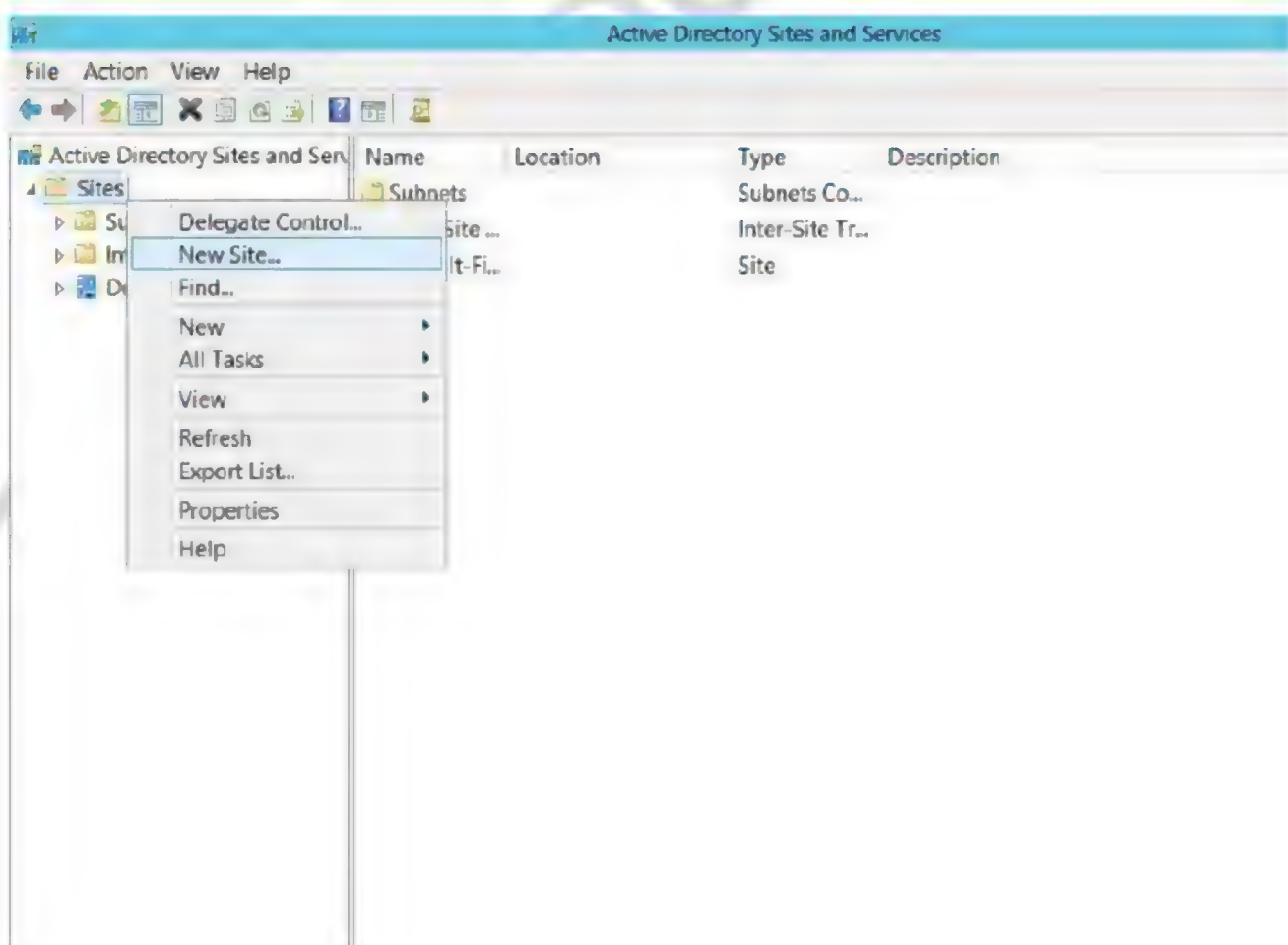
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

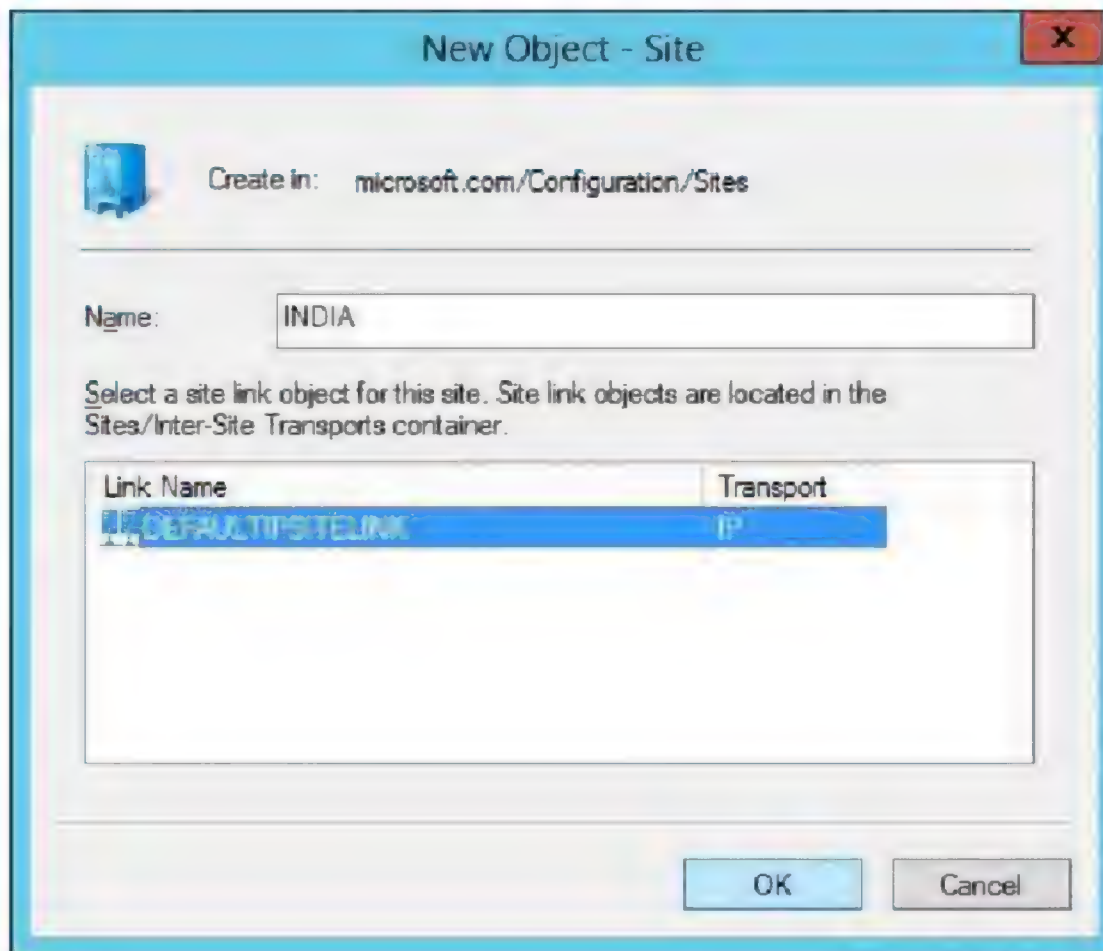
1. Logon to D.C as Administrator, go to Start, **Active Directory Sites and Services**.



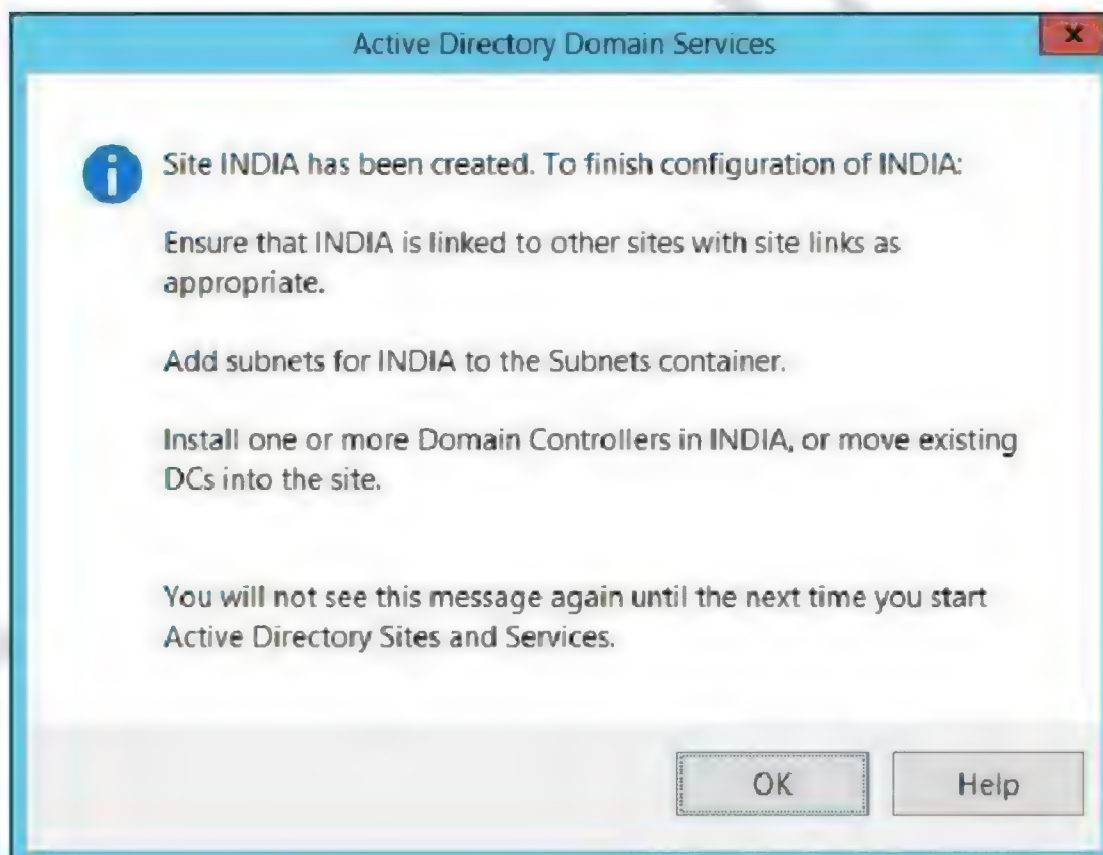
2. Right click **Sites** → **New Site**.



- Enter the site name (**INDIA**) and select **DEFAULTSITE LINK** and click **OK**.



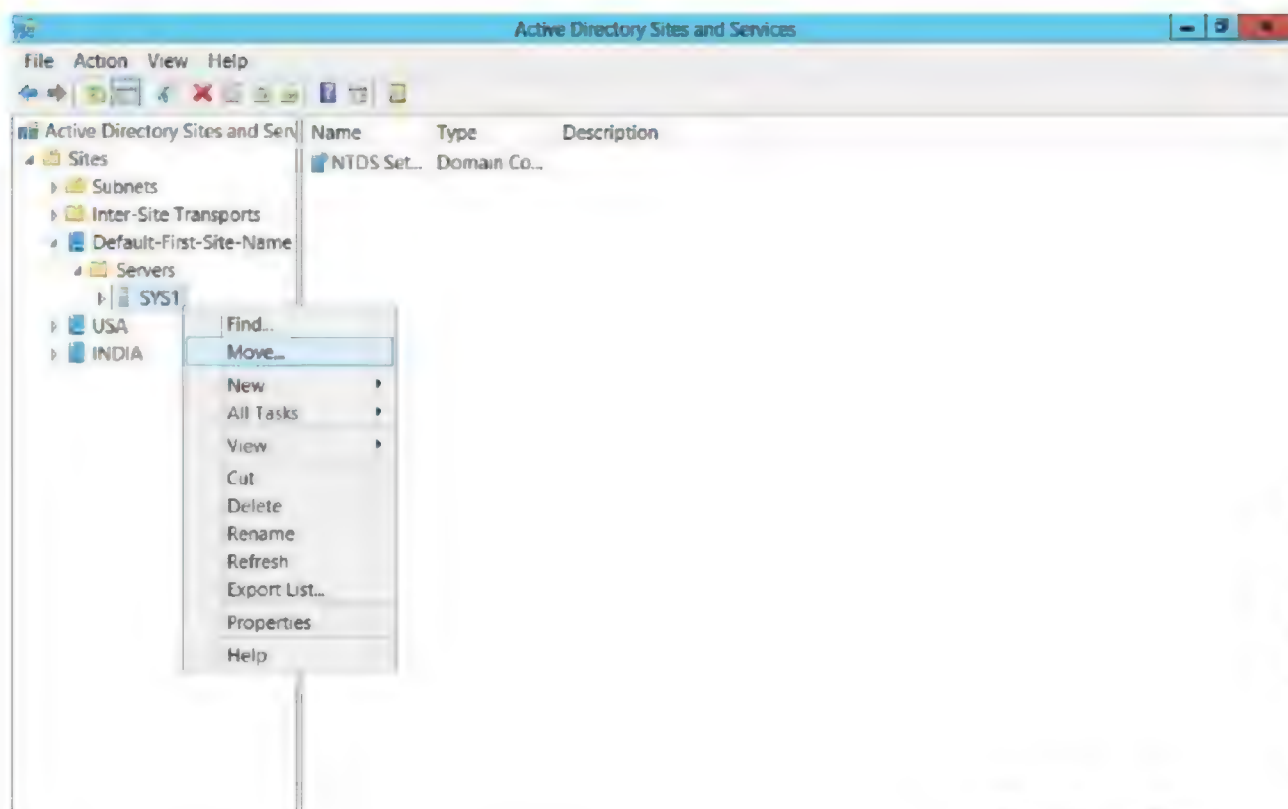
- Site **INDIA** will be created, click **OK**.



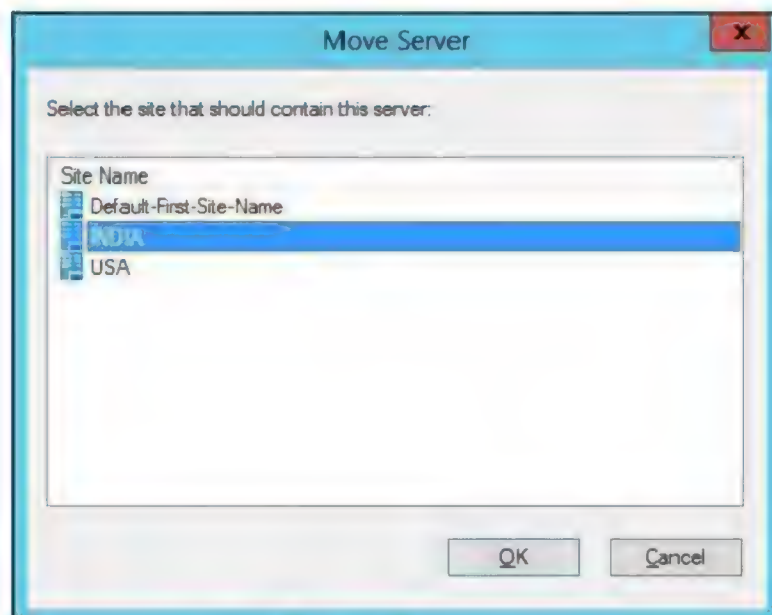
- Similarly create another site (**USA**)



6. Expand **Default-First-Site-Name** → Expand **Servers** → Right click **Server (SYS1)** → **Move**



7. Select the Site (**INDIA**) and click **OK**.



8. Server is now moved under **INDIA** site.

## Lab – 44: Creating Active Directory Site-Links

**Objective:**

To create site links to configure replication between servers in different sites

**Pre-requisites:**

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.

**Topology:**

MICROSOFT.COM

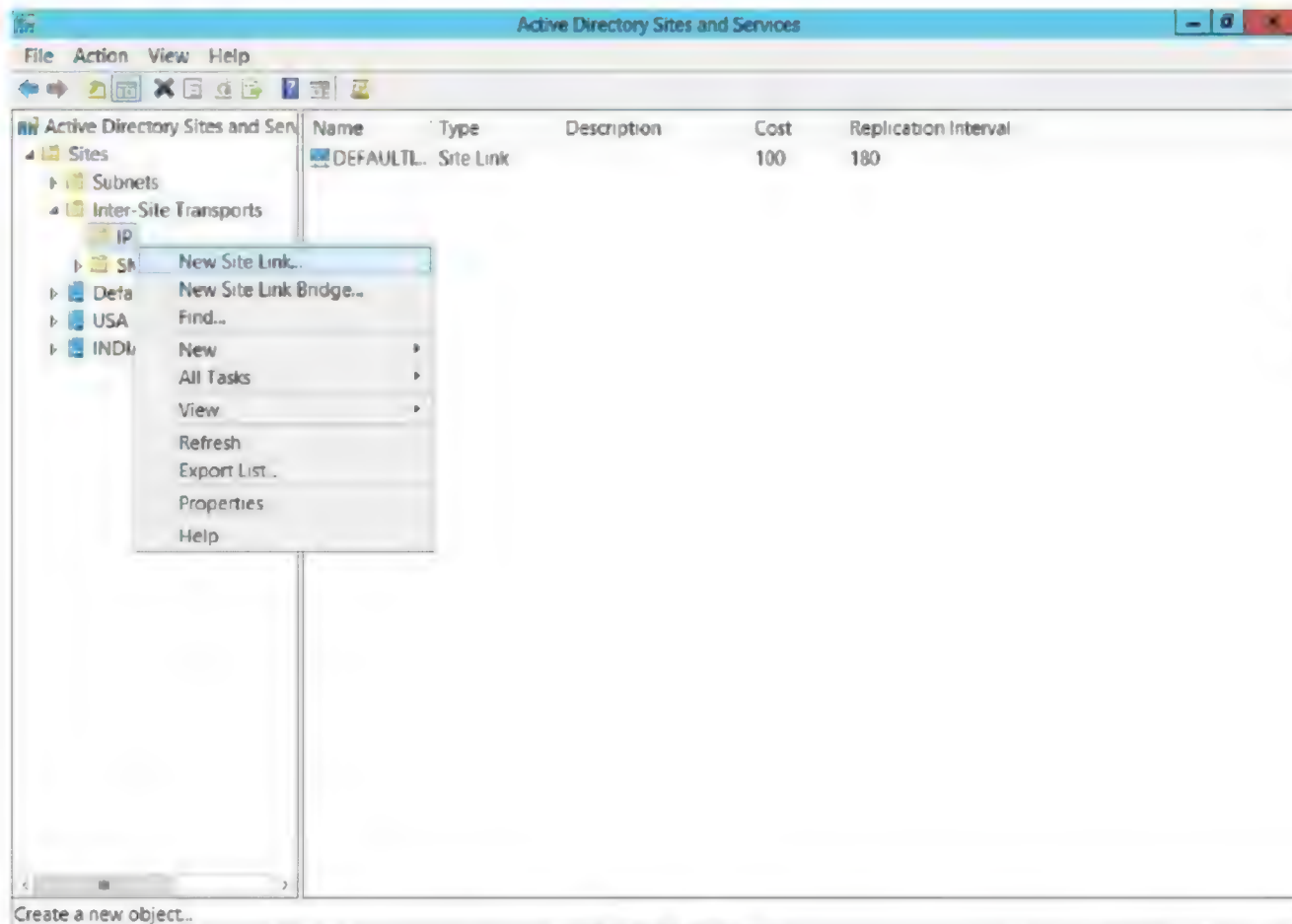
**SYS1**

**Domain Controller**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Log on to D.C as Administrator
2. Go to **Active Directory Sites and Services** → Expand **Sites** → Expand **Inter-Site Transports** → Right click **IP** → Select **New Site Link**.



3. Enter the name (**INDIA-USA Link**), select INDIA and USA sites and click **Add** → click **OK**.

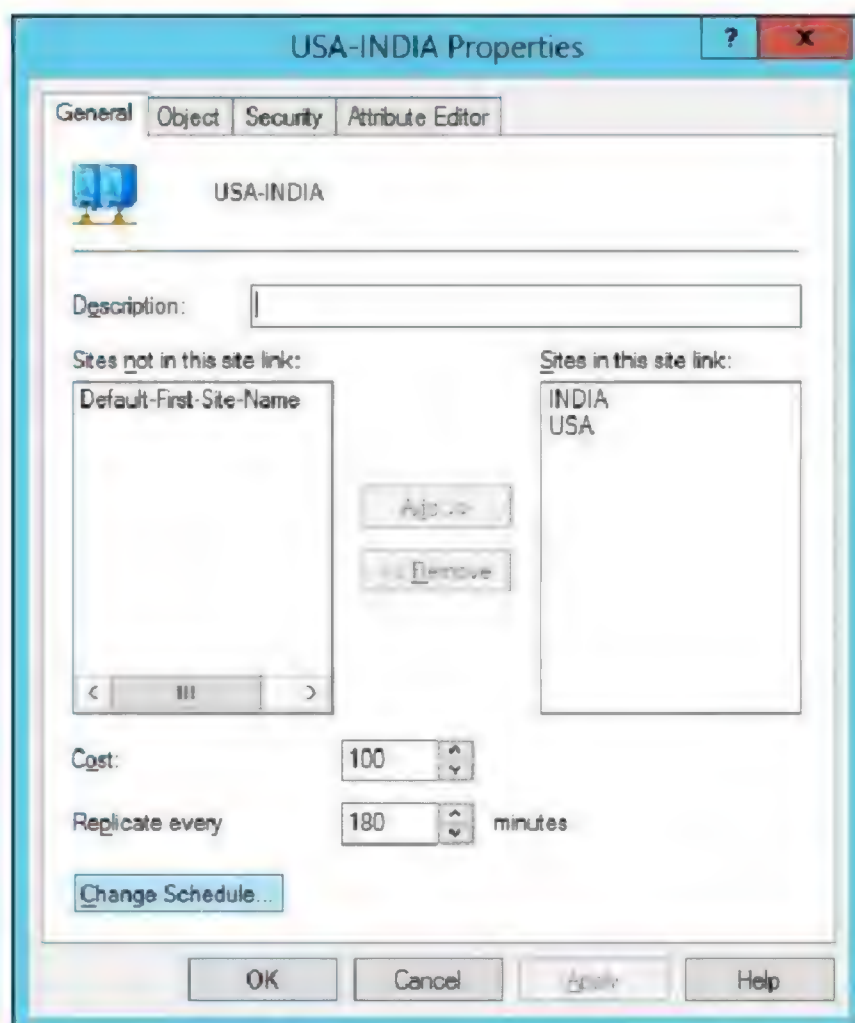




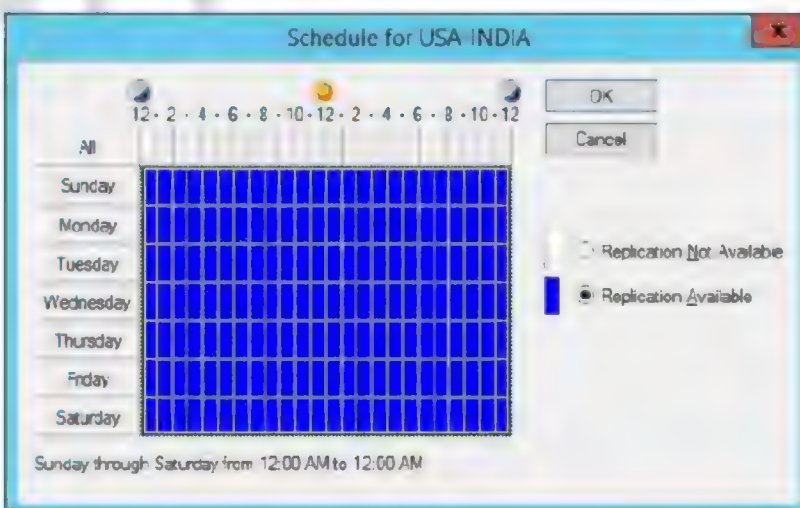
4. Right click **INDIA-USA Link**, select **Properties**.



5. Click **Change Schedule**.



6. Select the Interval of Time for **Replication Available**, click **OK**→**OK**.



## Lab – 45: Installing Read Only Domain Controller

### Objective:

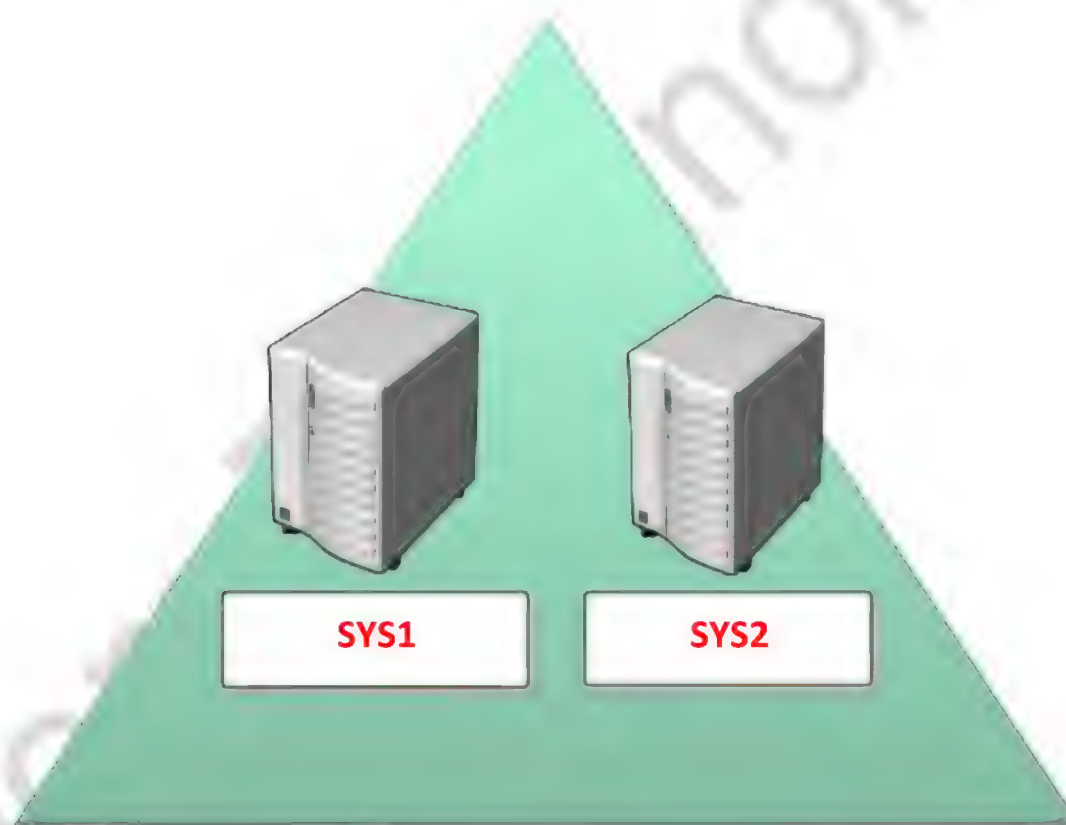
To install read only domain controller in branch offices

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1
Alternate DNS	-----

#### SYS2

##### Read Only Domain controller

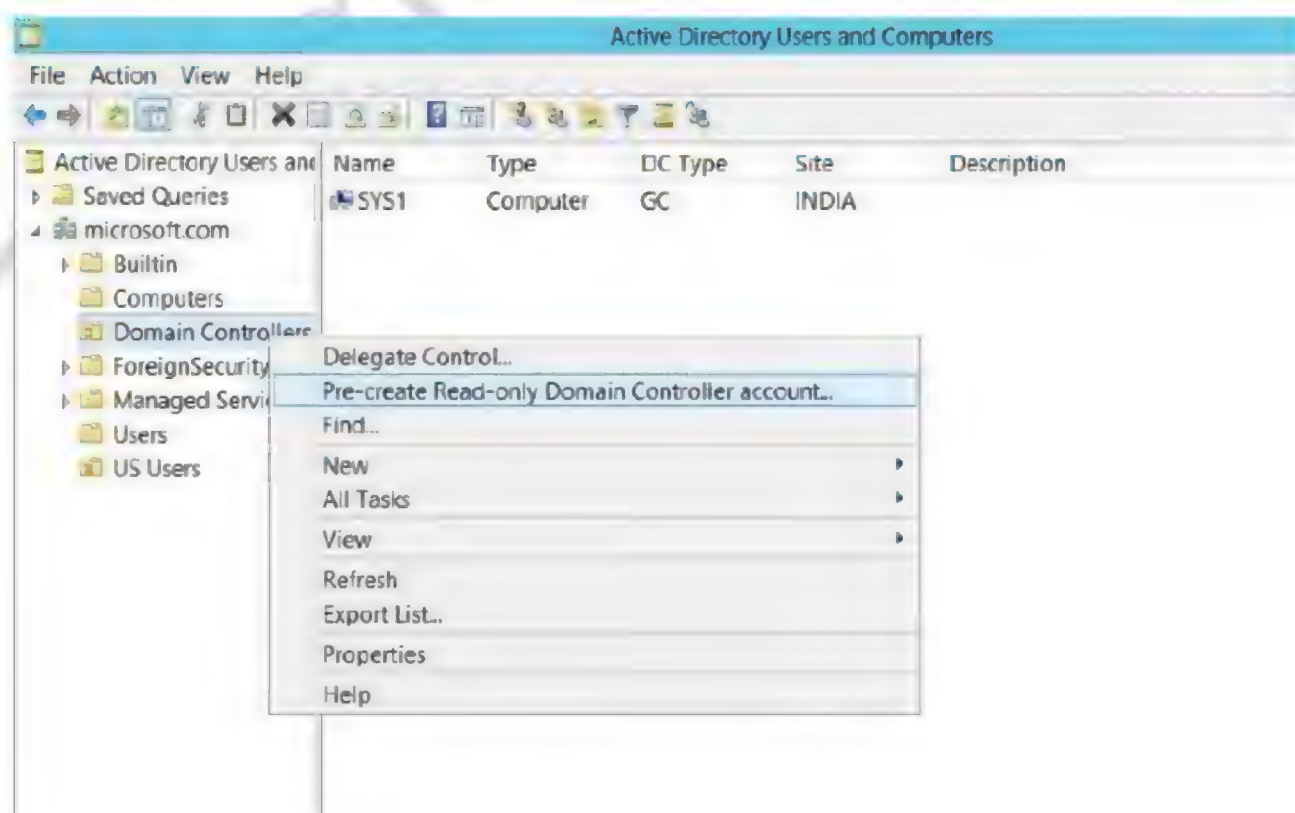
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2
Alternate DNS	10.0.0.1

## Creating a Pre-Create Read Only Domain Controller Account

1. Log in as **Administrator** to the **Domain Controller (SYS1)**.
2. Verify Domain and Forest Functional Levels to **Windows Server 2008 or later**.
3. Go to **Active Directory Users and Computers**.



4. Create Users (Ex: User1, User2, User3, User4, User5).
5. Right click Domain Controllers, Select **Pre-create Read-only Domain Controller account**.

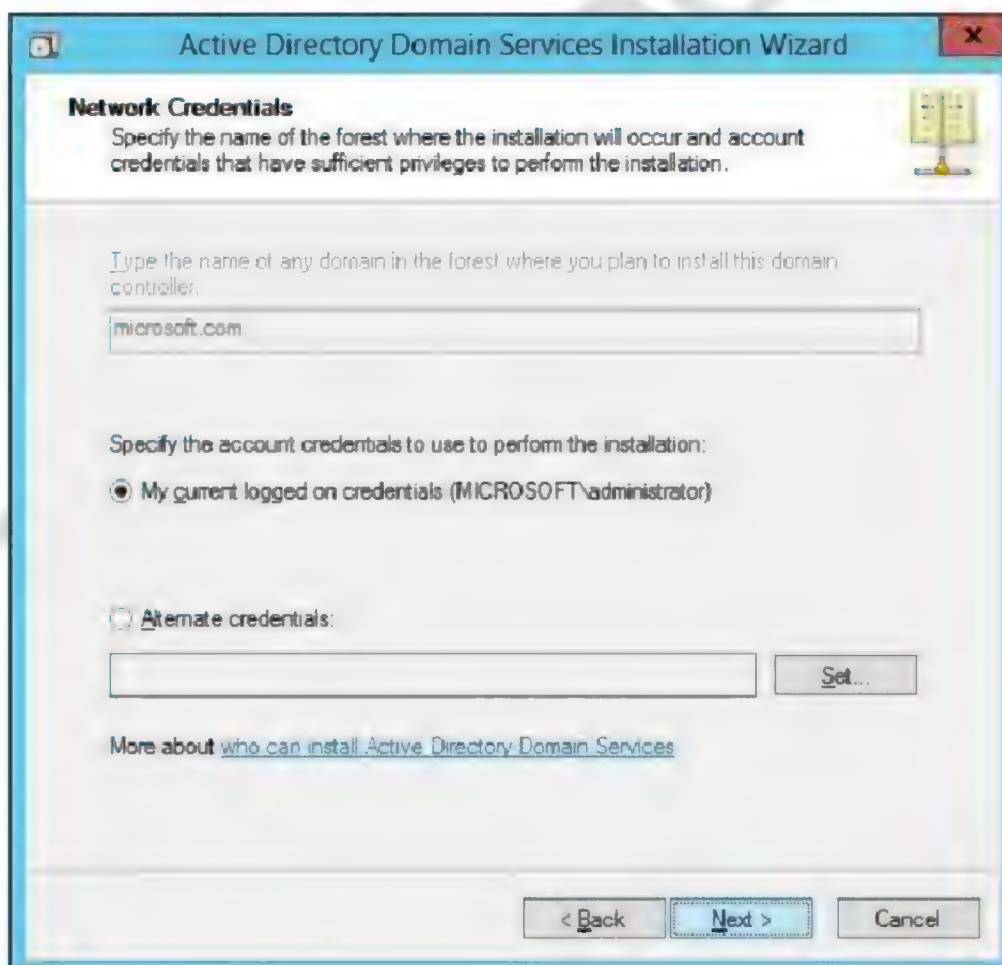




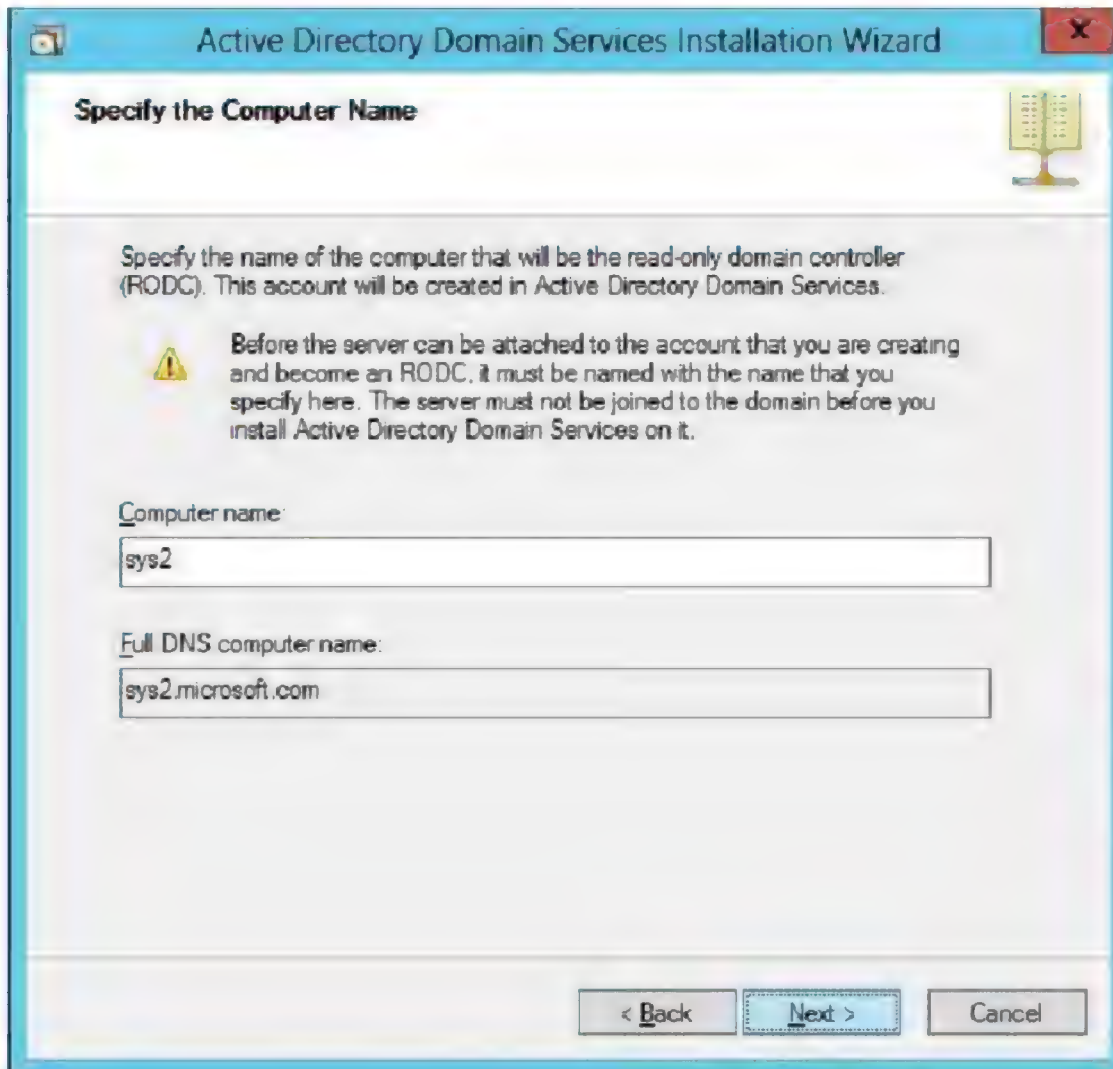
6. In Welcome Screen, click **Next**.



7. Select **My current logged on credentials (MICROSOFT\Administrator)** and click **Next**.



8. Enter the **Computer Name(SYS2)** of Read Only Domain Controller.



**Active Directory Domain Services Installation Wizard**

**Specify the Computer Name**

Specify the name of the computer that will be the read-only domain controller (RODC). This account will be created in Active Directory Domain Services.

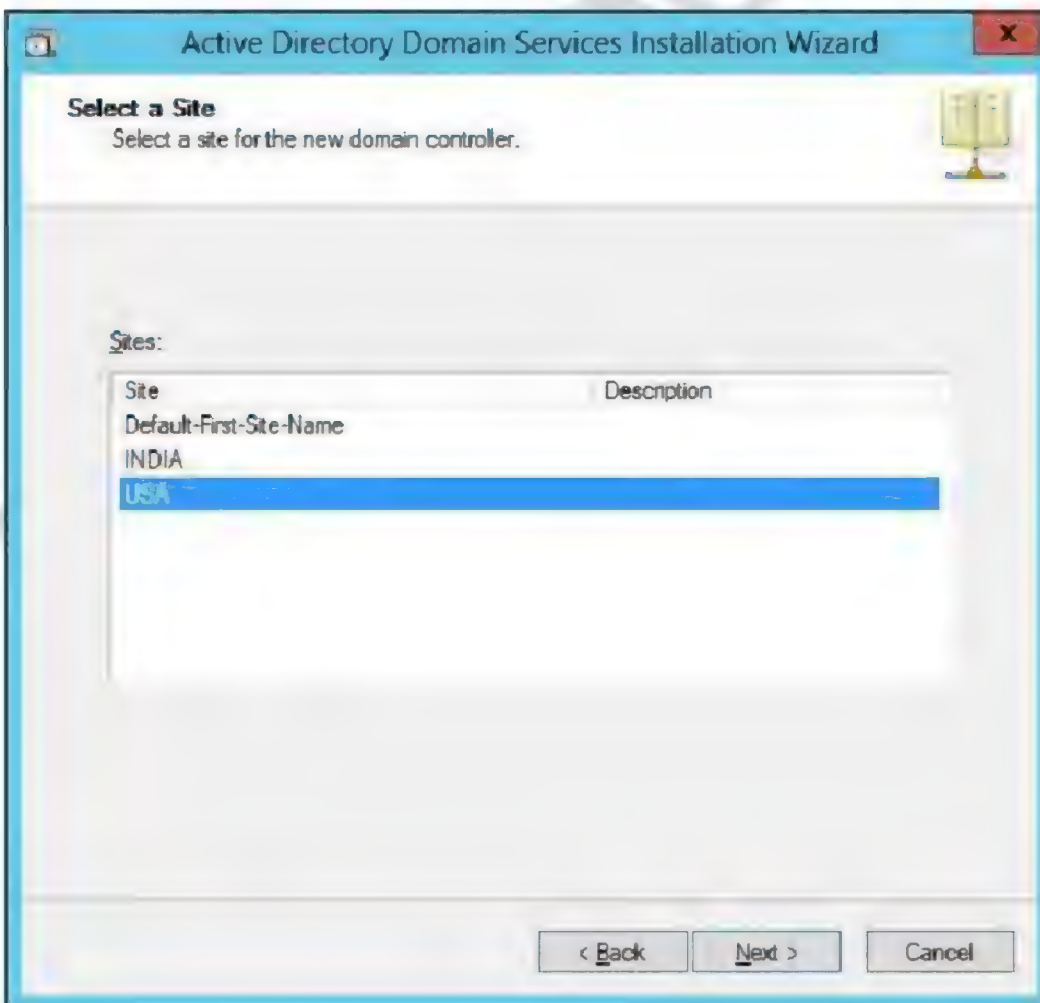
**Before the server can be attached to the account that you are creating and become an RODC, it must be named with the name that you specify here. The server must not be joined to the domain before you install Active Directory Domain Services on it.**

Computer name:  
sys2

Full DNS computer name:  
sys2.microsoft.com

< Back Next > Cancel

9. Select the Site (**USA**) for the Read-only Domain Controllers and click **Next**.



**Active Directory Domain Services Installation Wizard**

**Select a Site**

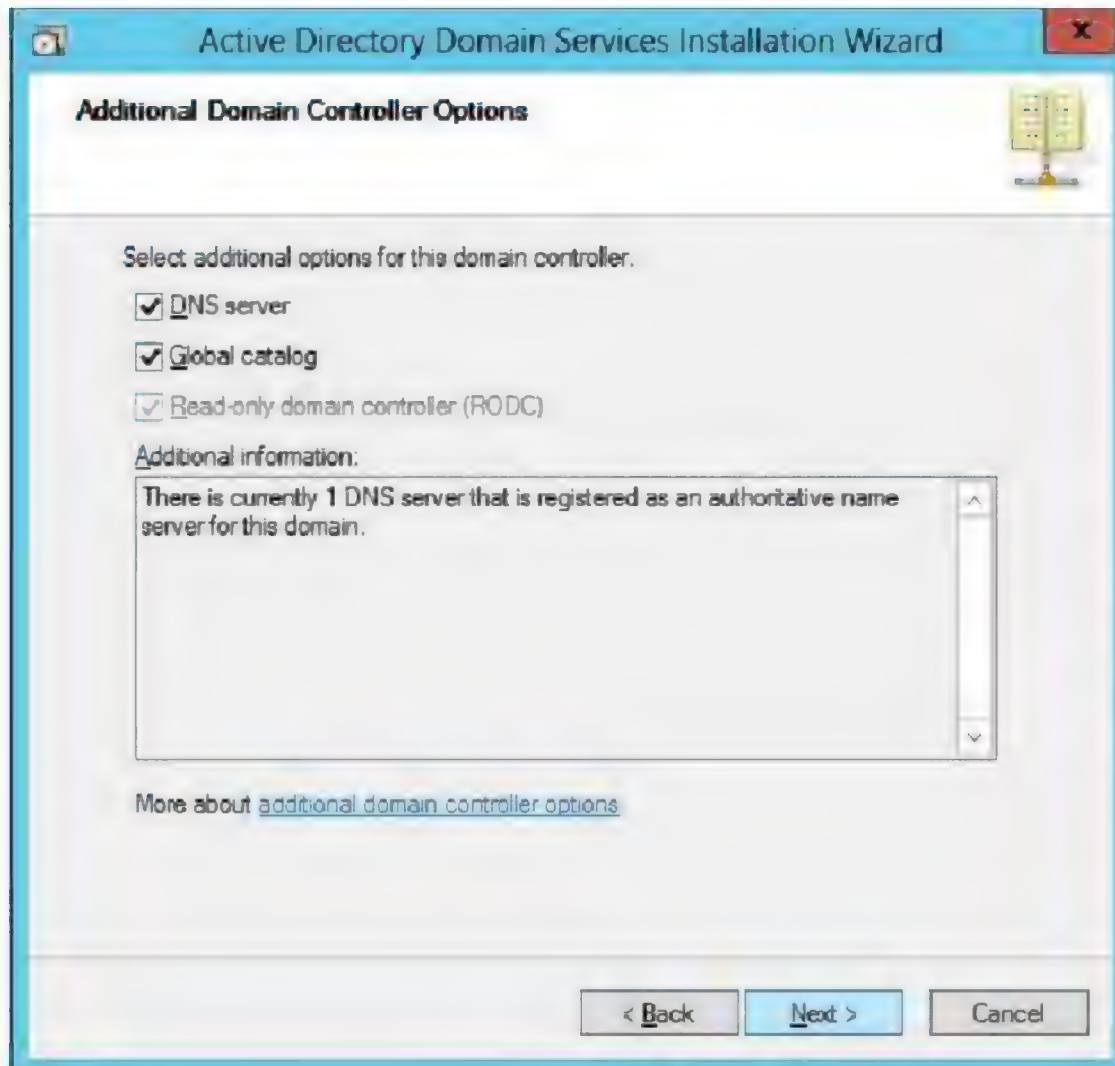
Select a site for the new domain controller.

Sites:

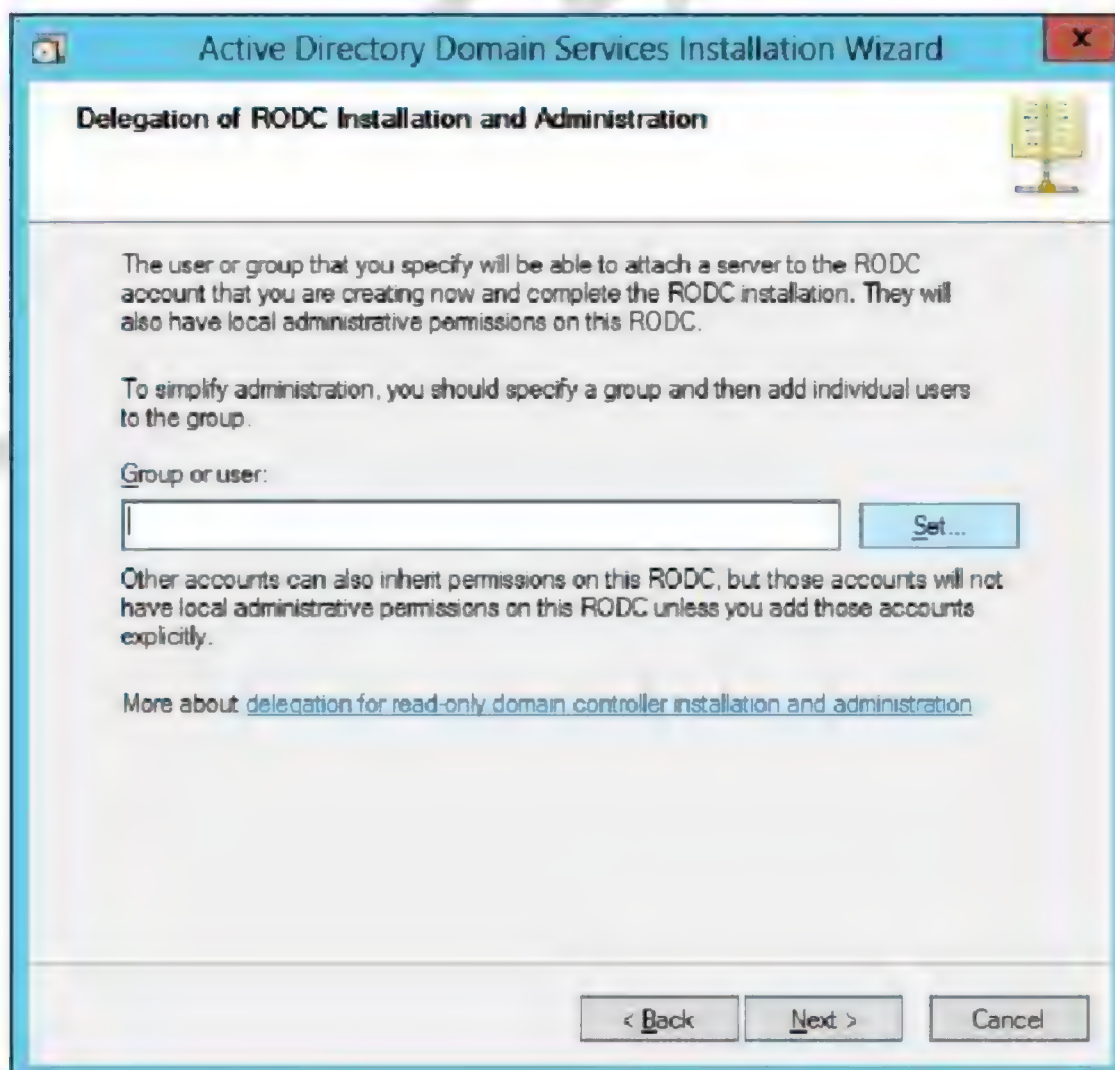
Site	Description
Default-First-Site-Name	
INDIA	
<b>USA</b>	

< Back Next > Cancel

10. Verify the **DNS**, **Global Catalog** and **Read-only Domain Controller (RODC)** checkboxes and click **Next**.



11. Click **Set**.

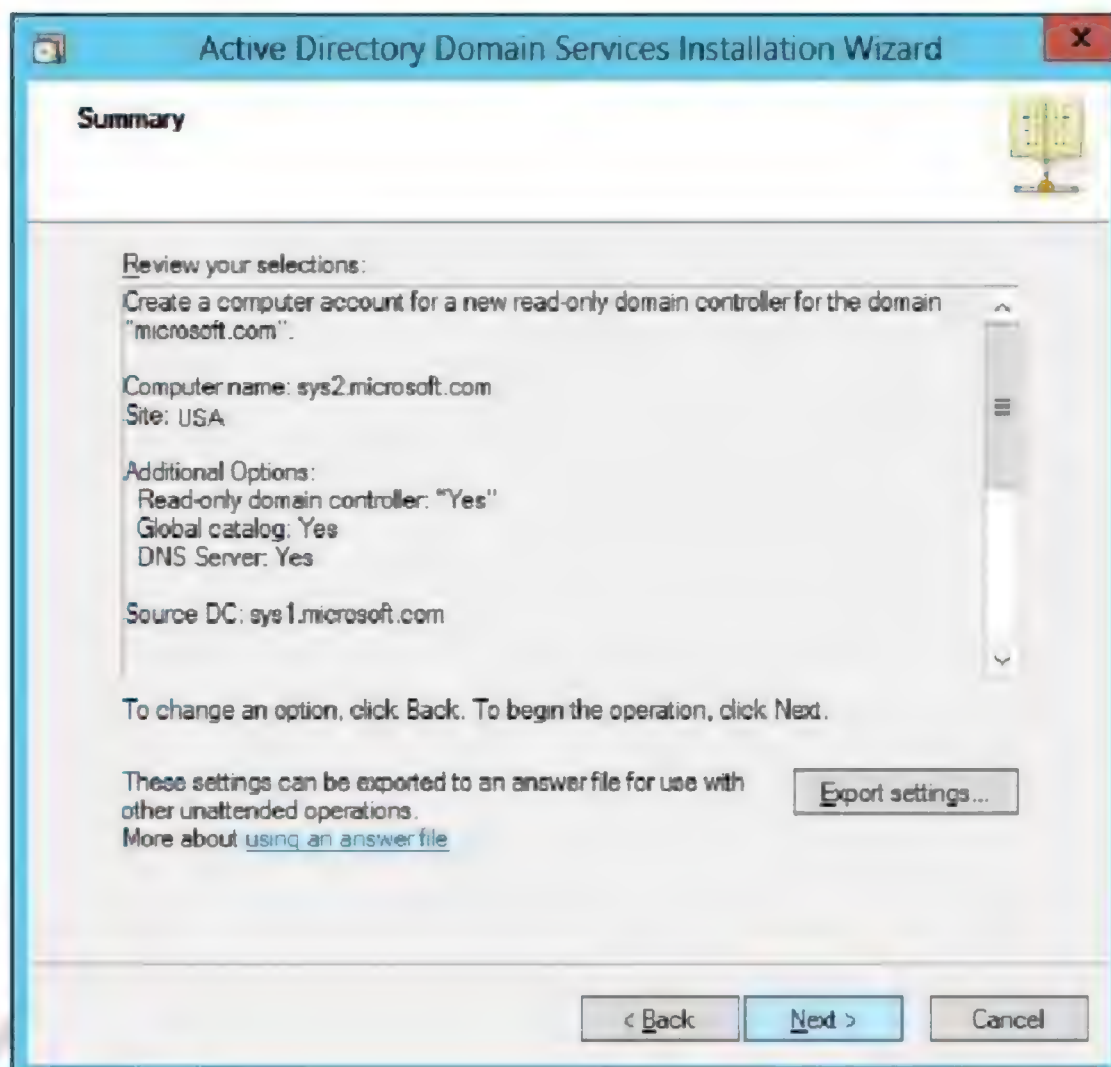




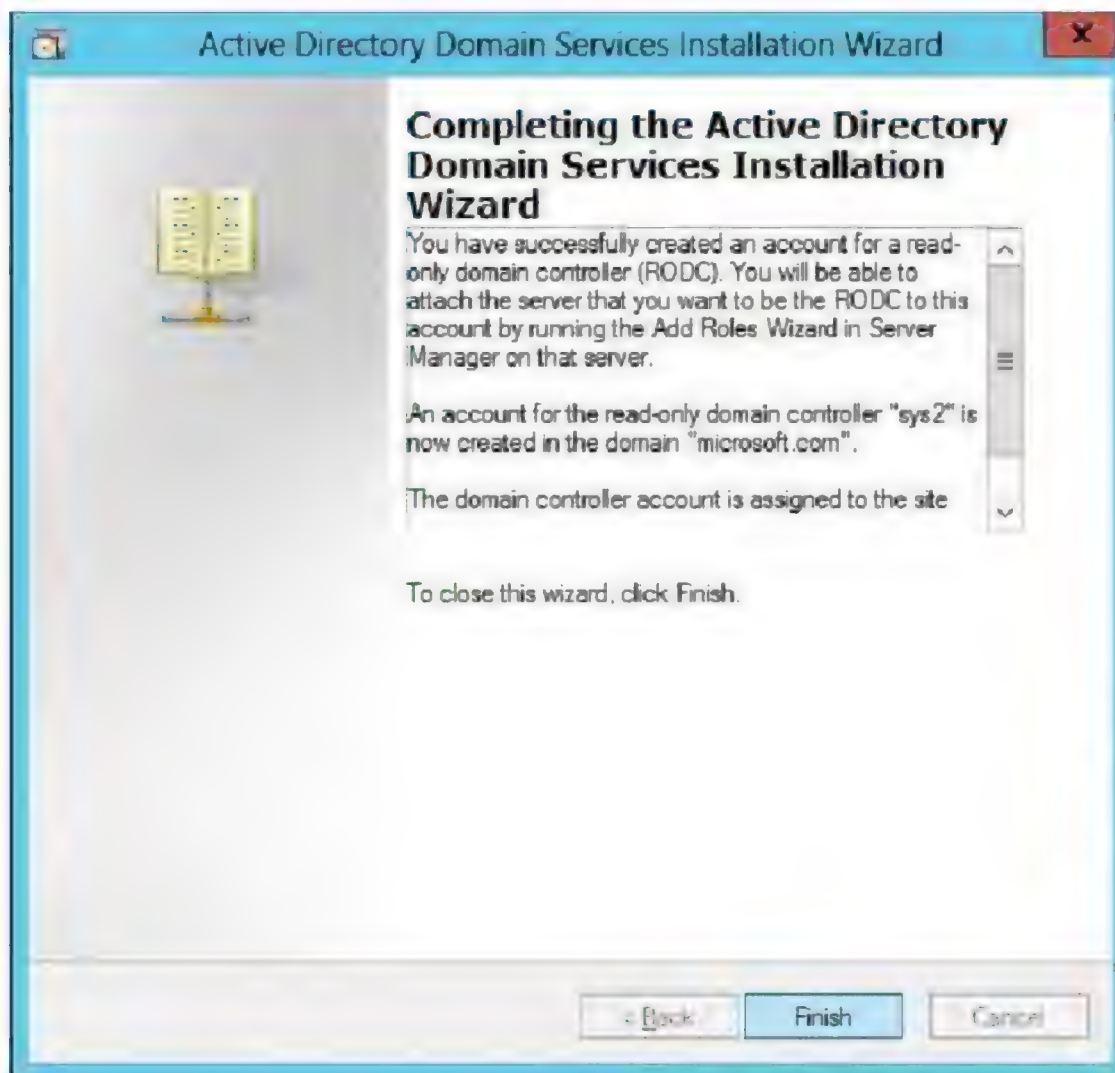
12. Enter the User name (**User1**) and click **OK** and click **Next**.



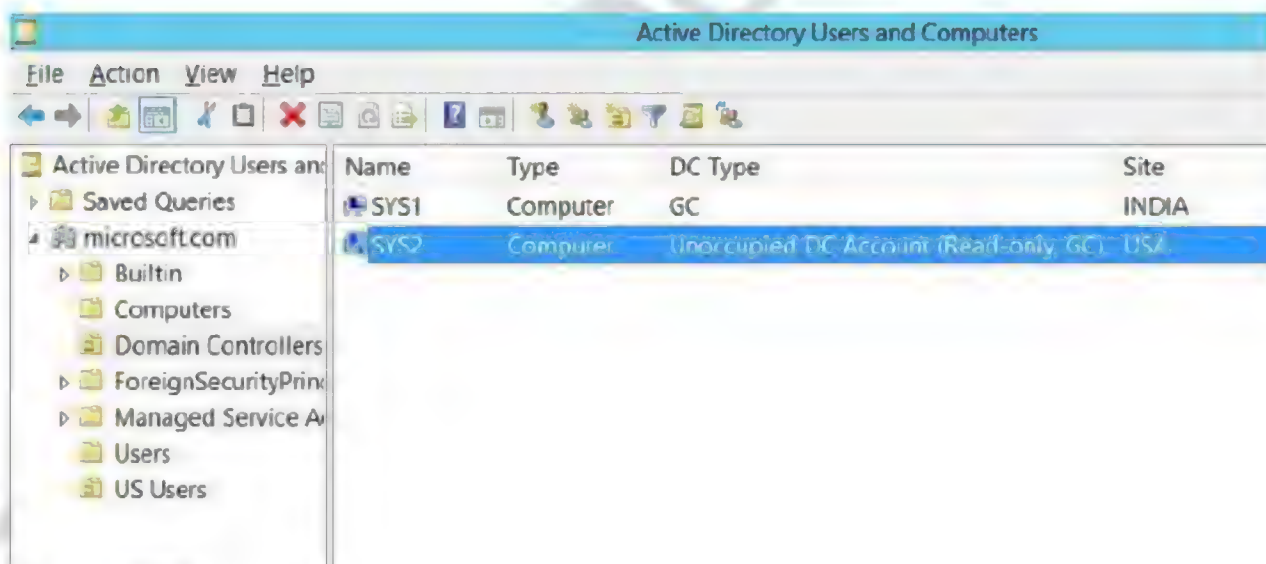
13. Review the Summary, and click **Next**.



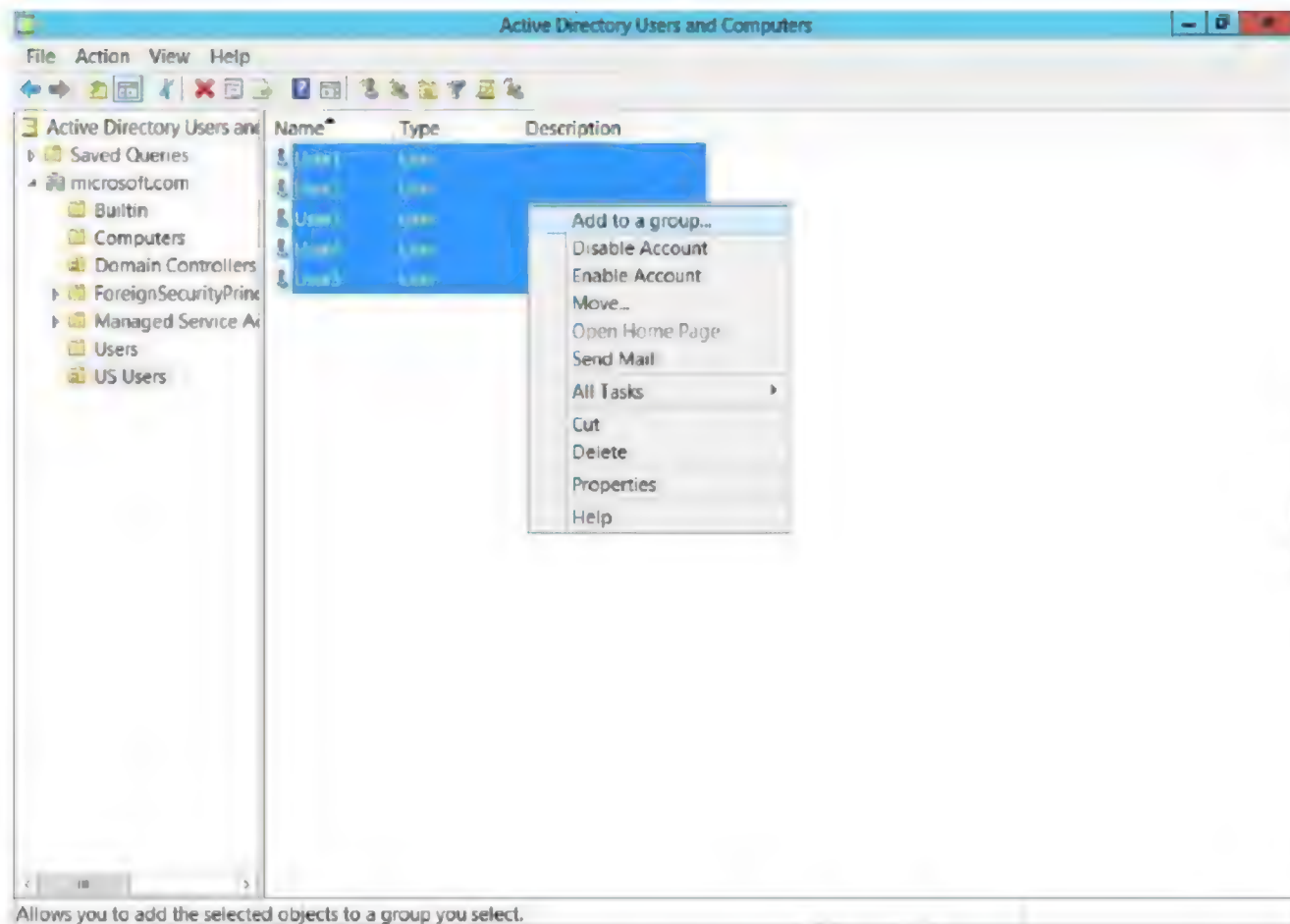
14. Click **Finish**.



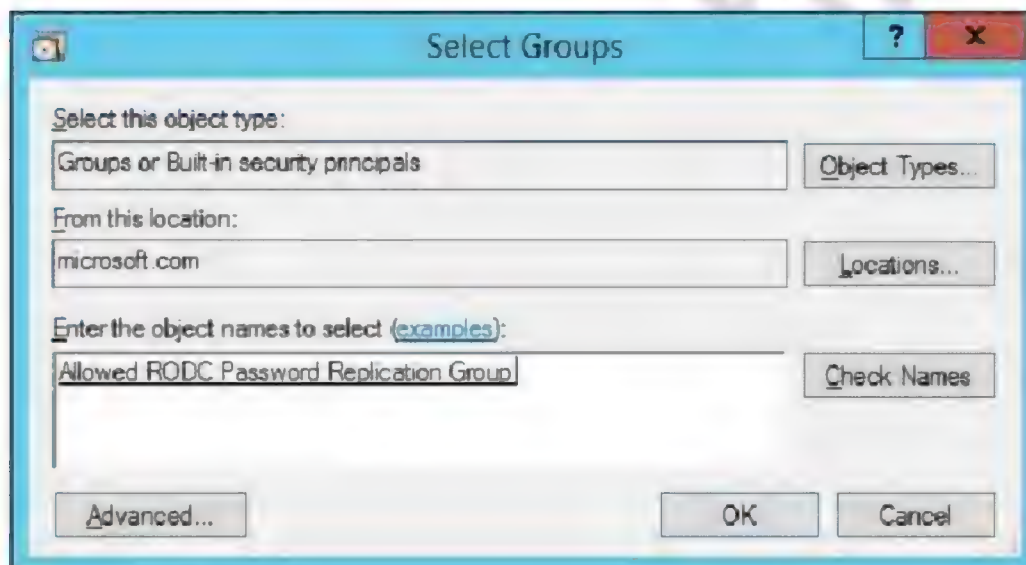
15. Account of Read-only Domain Controller will be created in Domain Controllers.



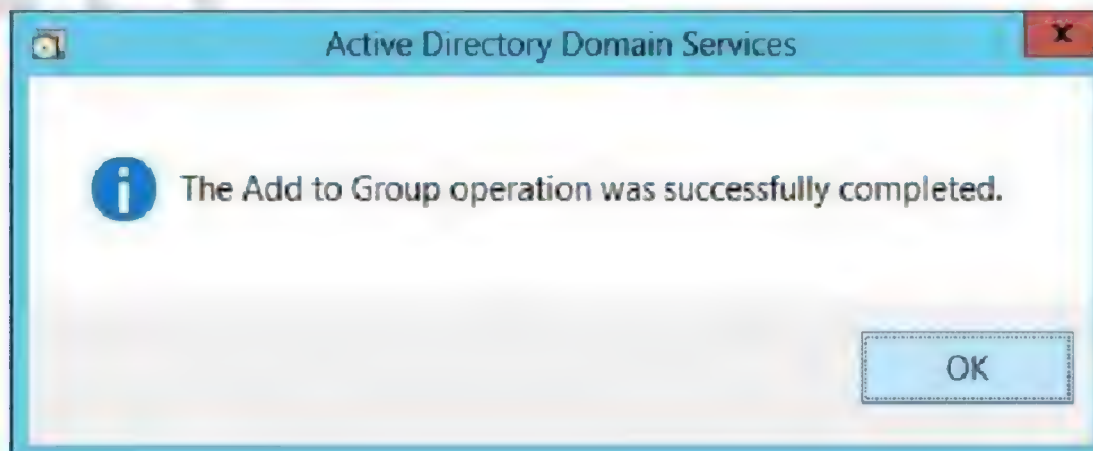
16. To cache the user account password on RODC, Select the Users (User1, User2, User3, User4, User5) Right click and select **Add to a Group**.



17. Enter the Group Name **Allowed RODC Password Replication Group** and click **OK**.



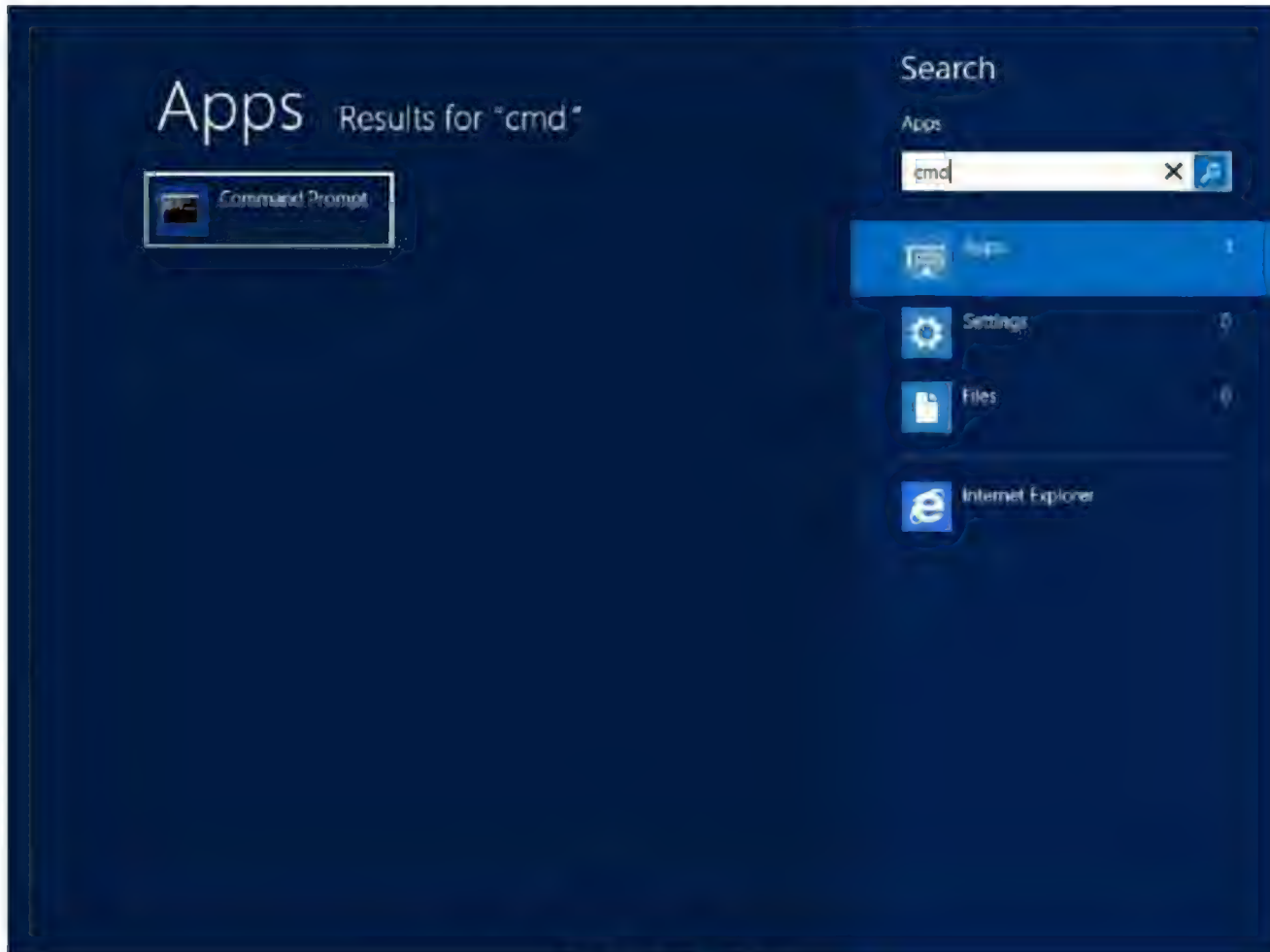
18. The Users will be added to the Group, click **OK**.





## Configuring Read-Only Domain Controller using IFM

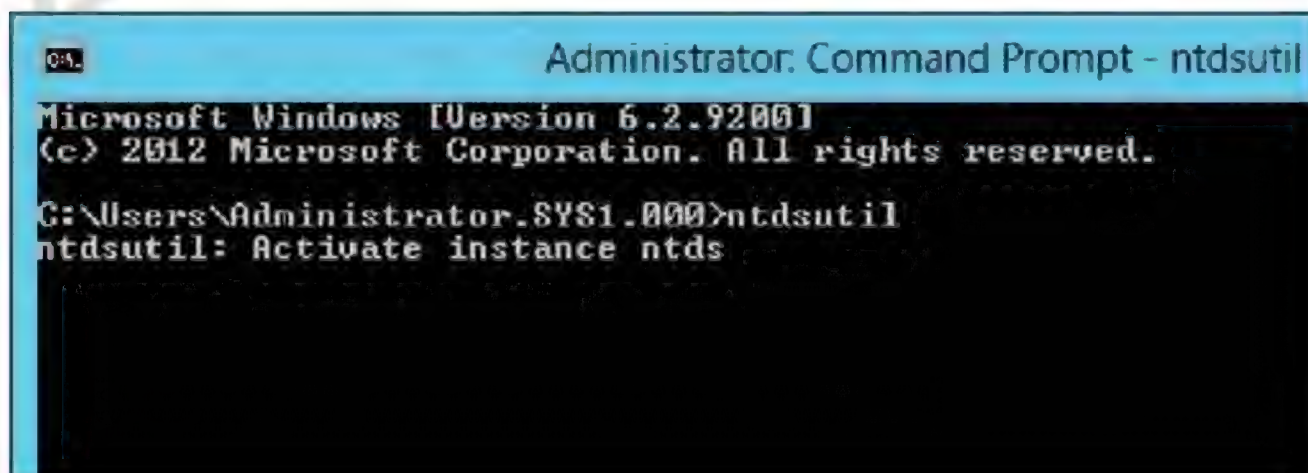
1. Log in as **Administrator** to the **Domain Controller (SYS1)**.
2. Create a Shared folder (Ex: **ifm**) in C drive.
3. Go to Start, type cmd in Search Apps, and select **Command Prompt**



4. Type **Ntdsutil**



5. Type **Activate instance ntds.**



6. Type **ifm**.

```
Administrator: Command Prompt - ntdsutil
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.
C:\Users\Administrator\SYS1.000>ntdsutil
ntdsutil: activate instance ntds
Active instance set to "ntds".
ntdsutil: ifm
```

7. Type **createsysvolRODCC:\ifm**

```
Administrator: C:\Windows\system32\cmd.exe - n
C:\Users\Administrator>ntdsutil
ntdsutil: activate instance ntds
Active instance set to "ntds".
ntdsutil: ifm
ifm: create sysvol rodc c:\ifm
Creating snapshot for RODC media...
```

8. Verify for the **snapshot generated successfully** then type **quit**, and again **quit**.

```
Administrator: C:\Windows\system32\cmd.exe - ntdsutil
6E)\Machine\Scripts\Shutdown
Copying c:\ifm\SYVOL\microsoft.com\Policies\{8AE55408-3D6D-440C-8097-B88CECF2C0
6E)\Machine\Scripts\Startup
Copying c:\ifm\SYVOL\microsoft.com\Policies\{8AE55408-3D6D-440C-8097-B88CECF2C0
6E)\User
Copying c:\ifm\SYVOL\microsoft.com\Policies\{D7035A5B-1A4B-4C12-9C7E-5103ECA583
C6)\GPT.INI
Copying c:\ifm\SYVOL\microsoft.com\Policies\{D7035A5B-1A4B-4C12-9C7E-5103ECA583
C6)\Machine
Copying c:\ifm\SYVOL\microsoft.com\Policies\{D7035A5B-1A4B-4C12-9C7E-5103ECA583
C6)\User
Copying c:\ifm\SYVOL\microsoft.com\Policies\{D7035A5B-1A4B-4C12-9C7E-5103ECA583
C6)\User\comment.cmtx
Copying c:\ifm\SYVOL\microsoft.com\Policies\{D7035A5B-1A4B-4C12-9C7E-5103ECA583
C6)\User\Registry.pol
Copying c:\ifm\SYVOL\microsoft.com\scripts
Snapshot {df4c65c8-5498-4423-828c-311e480e3887} unmounted
IFM media created successfully in c:\ifm
ifm: q
ntdsutil: q
```

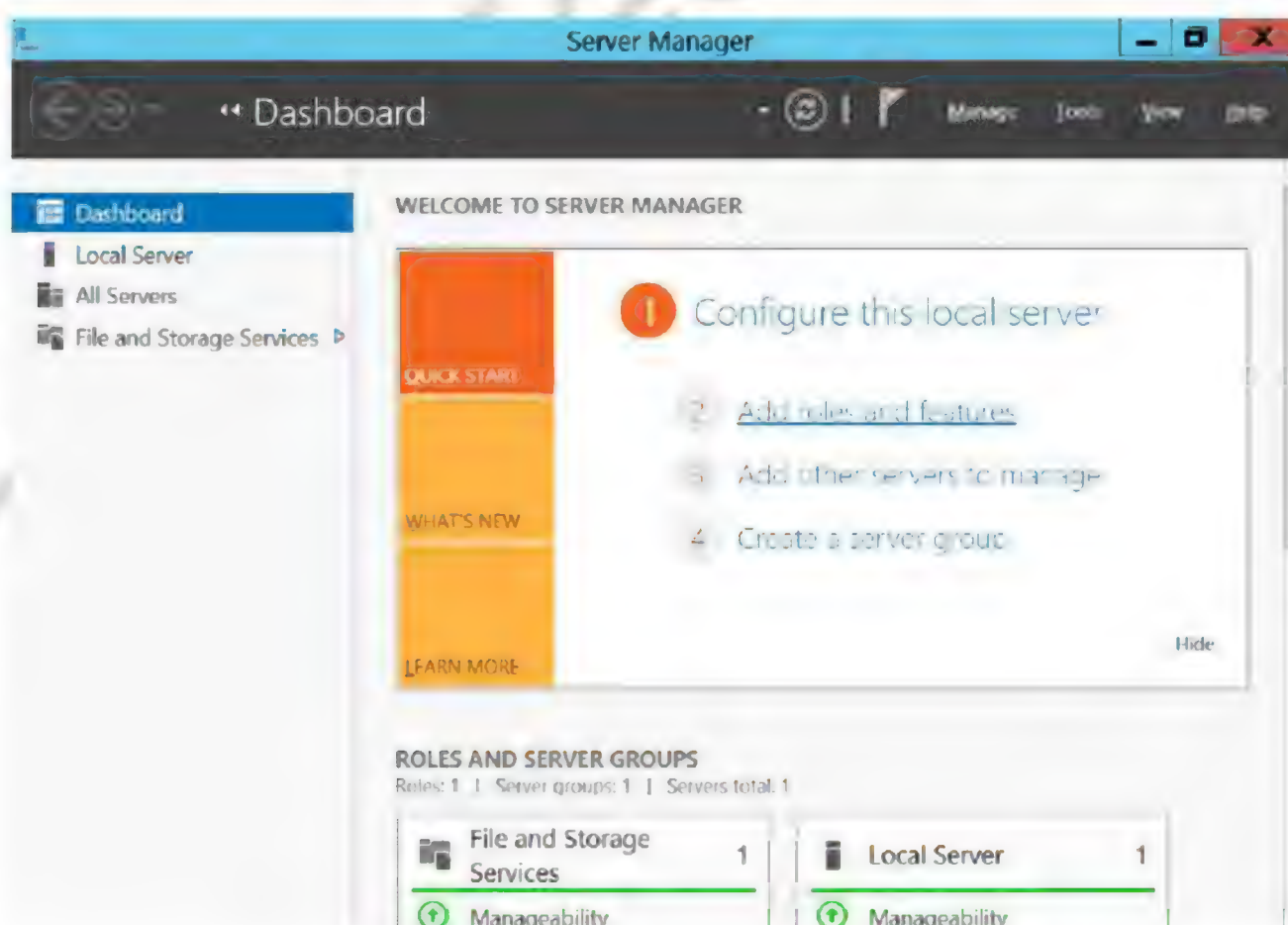
9. Log in as Administrator to the **Workgroup Computer(SYS2)**
10. Assign **IP Address** and Preferred **DNS Server Address**.



11. Access the shared folder (Ex: ifm) on Domain Controller and copy it to local hard disk drive (Ex: C drive).
12. Click **Server Manager**

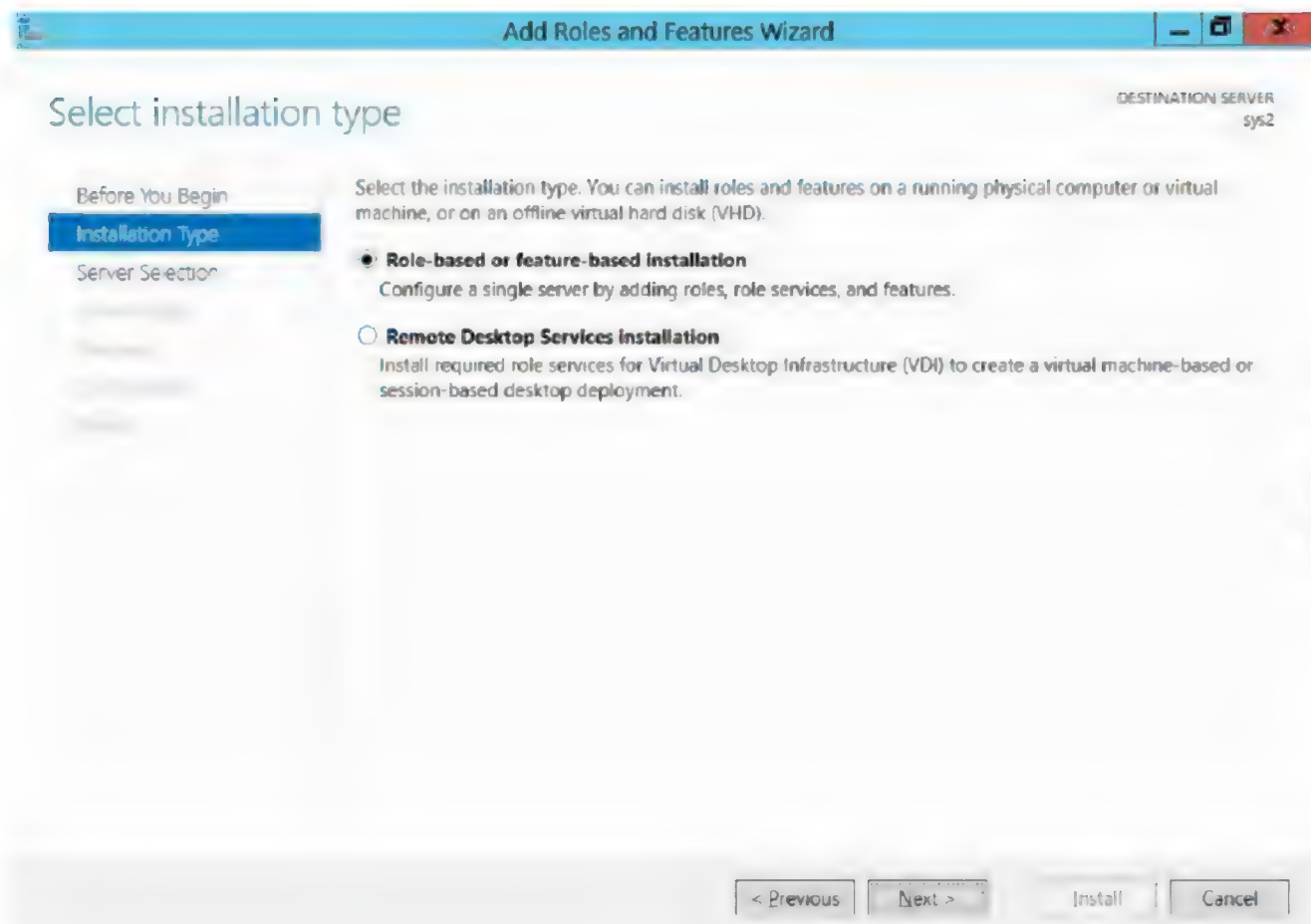


13. In Server Manager Dashboard, Click **Add roles and features**.

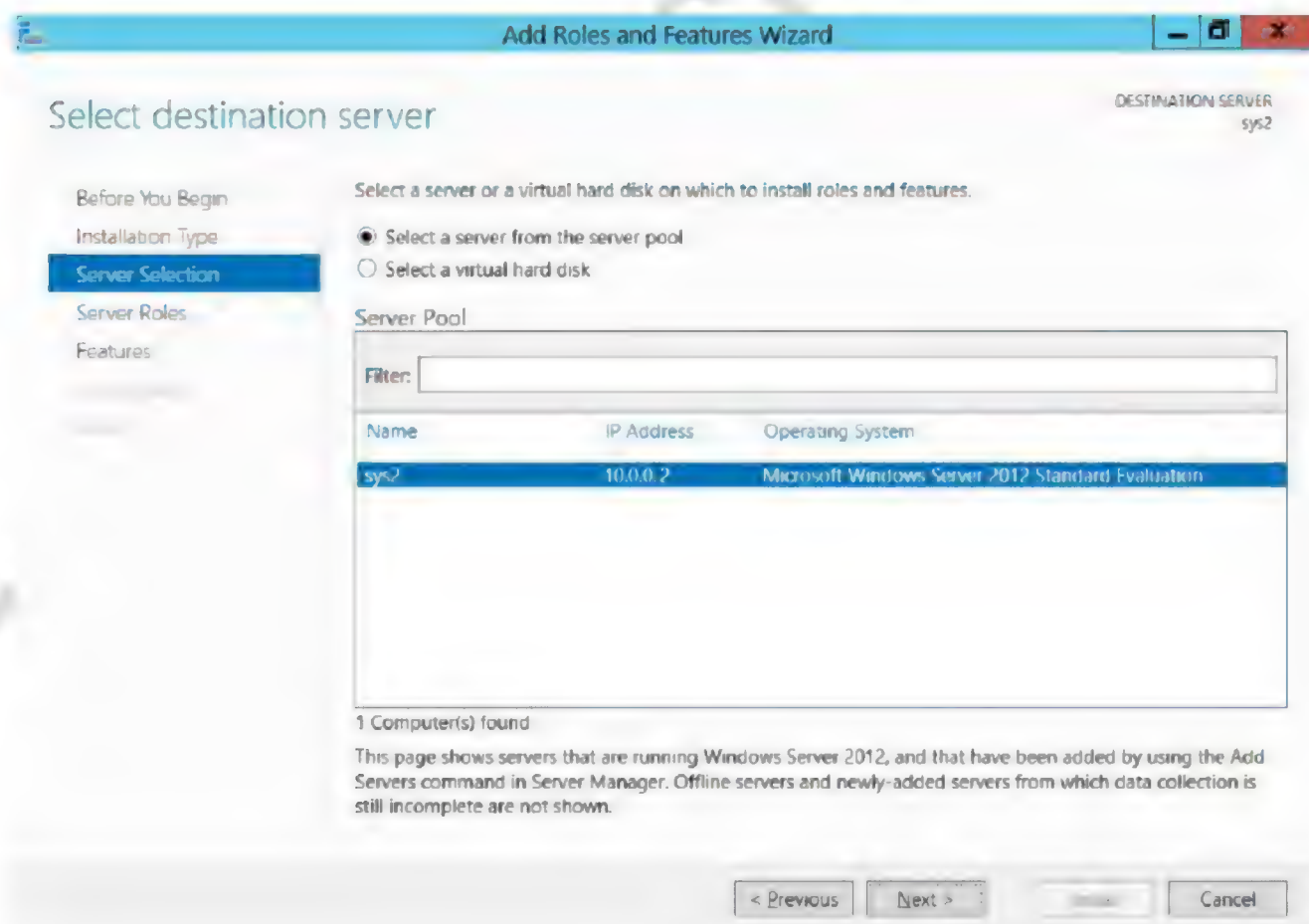




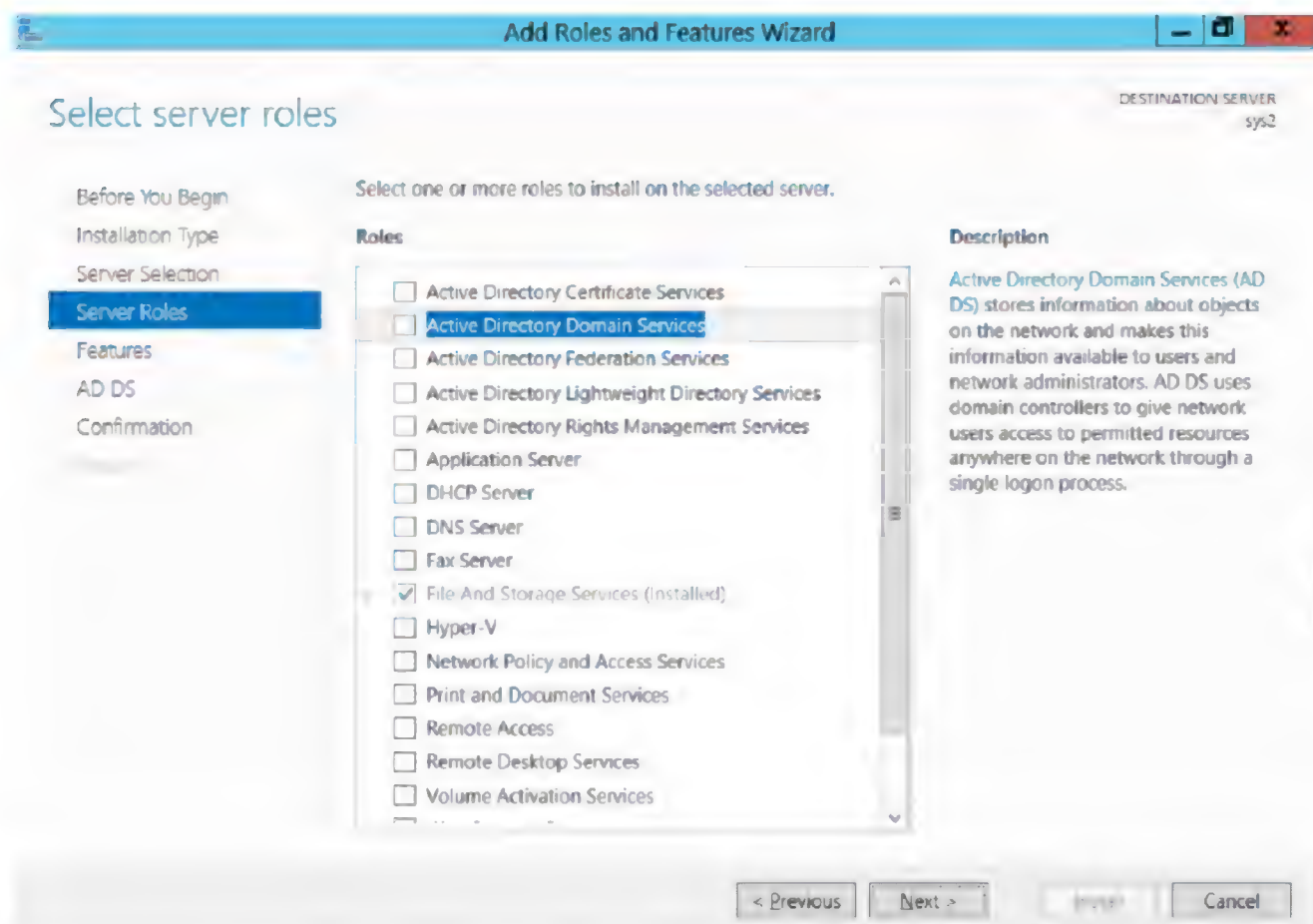
14. In Before you begin page, click **Next**, In Select installation type, select **Role-based or feature-based installation**, click **Next**.



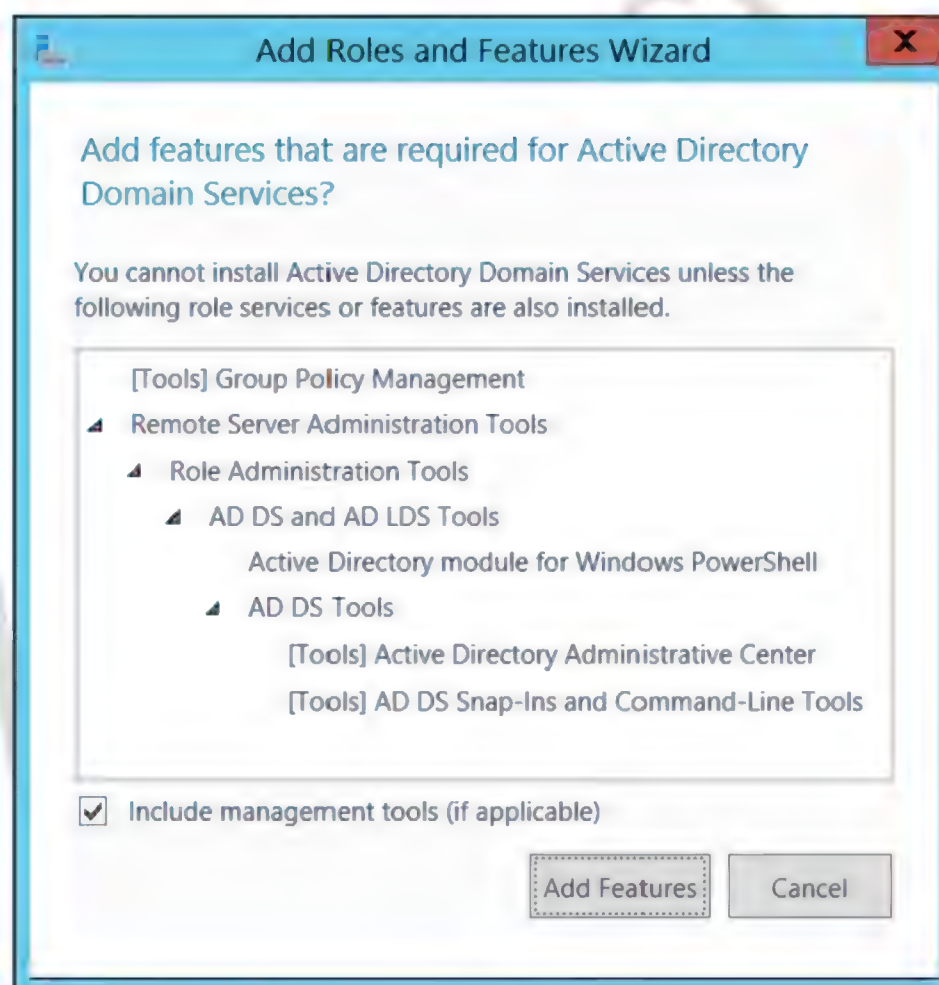
15. In Select destination server, from Server Pool select **SYS2**, click **Next**.



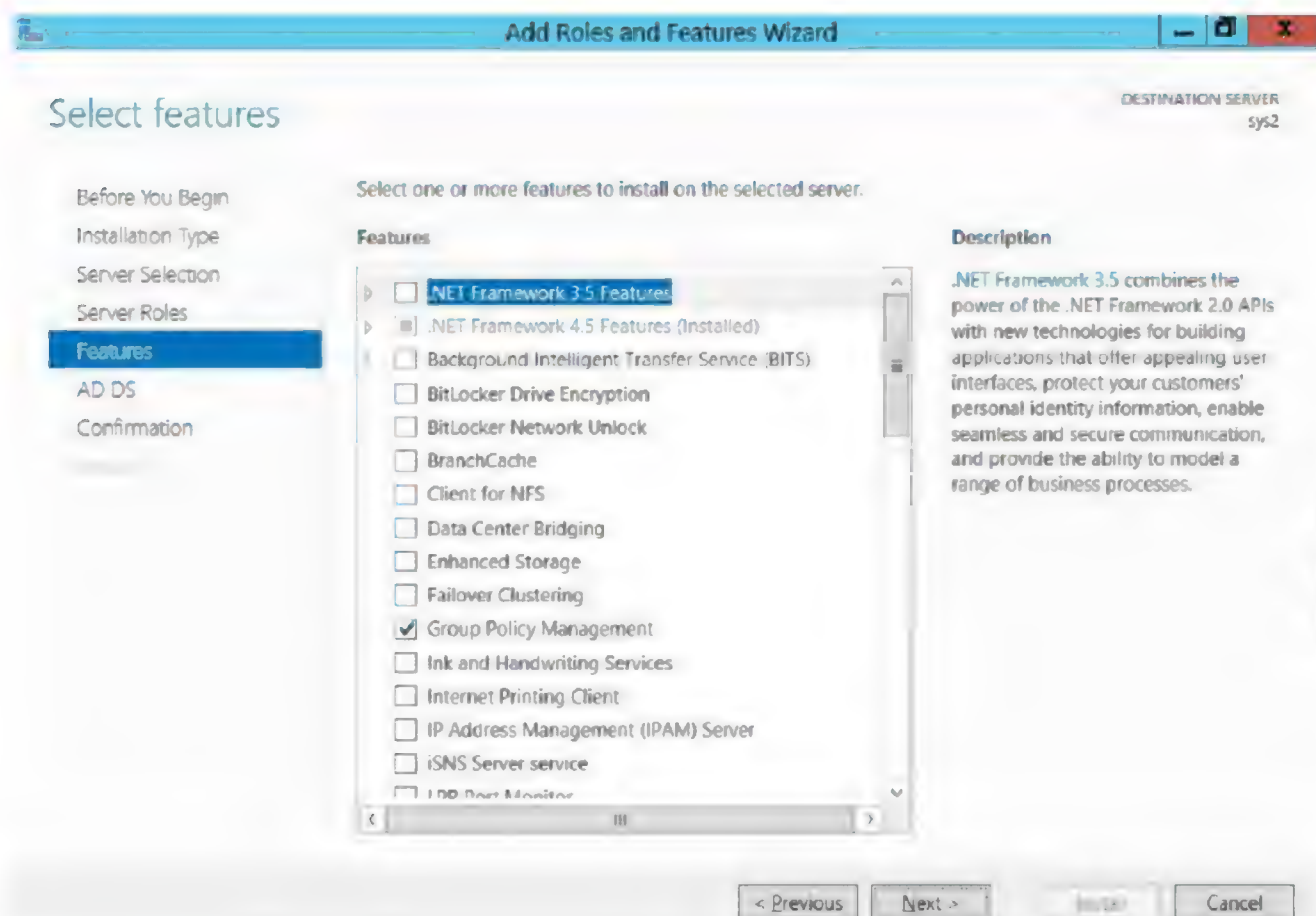
16. In Roles, check the box **Active Directory Domain Services**.



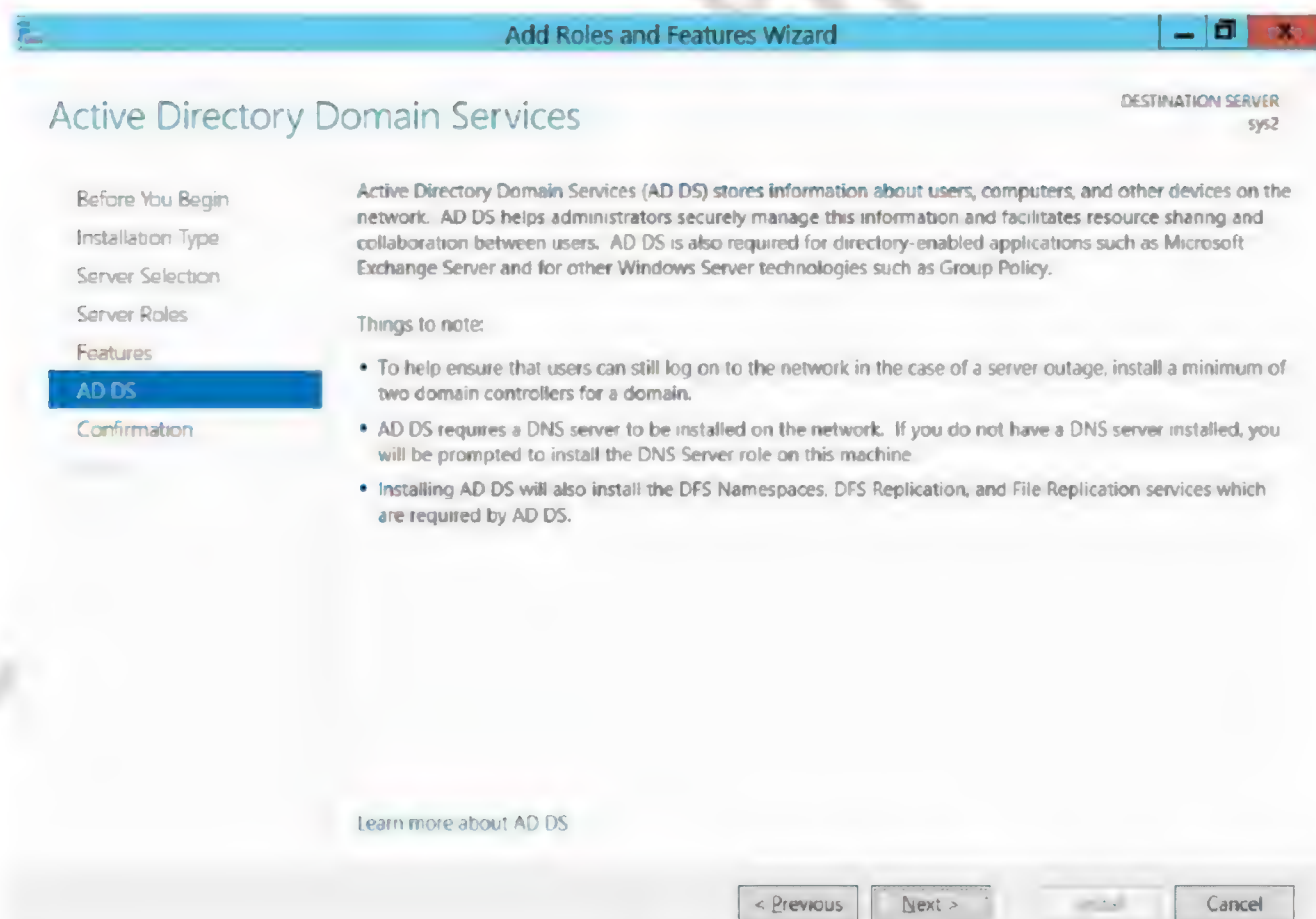
17. Click **Add Features**, to install the required features for Active Directory Domain Services. Click **Next**.



18. In Select features wizard, click **Next**.

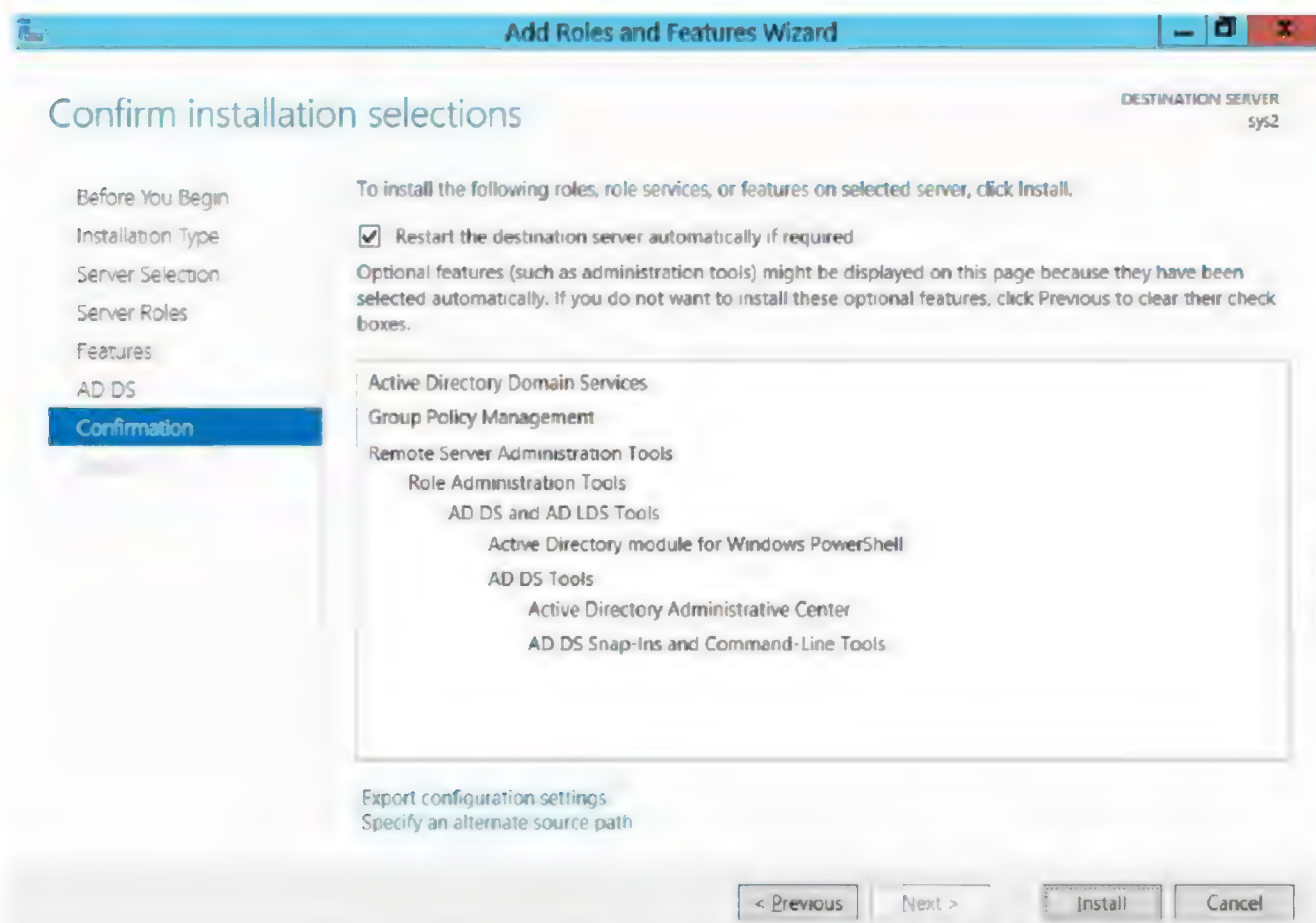


19. In Active Directory Domain Services wizard, click **Next**.

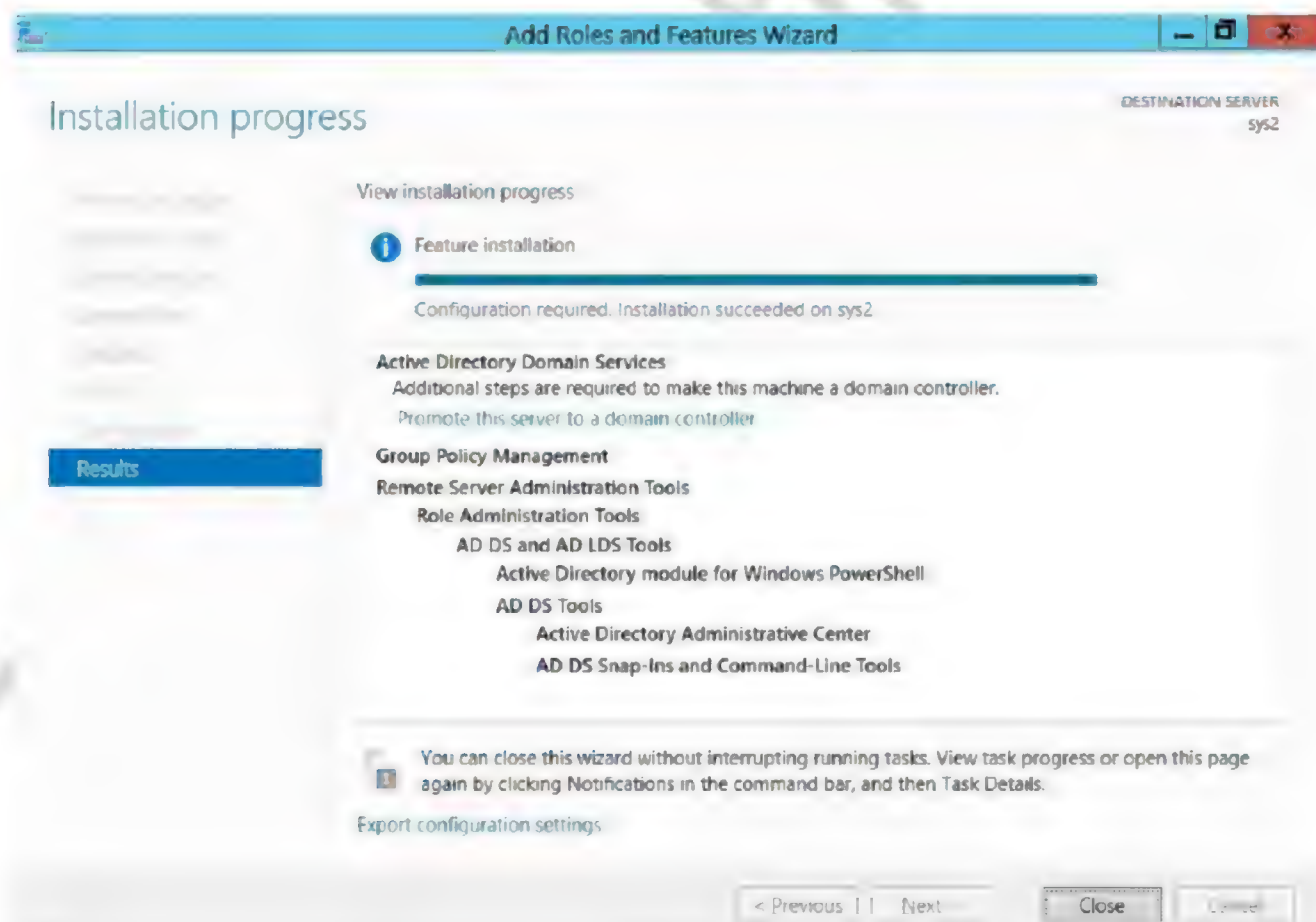




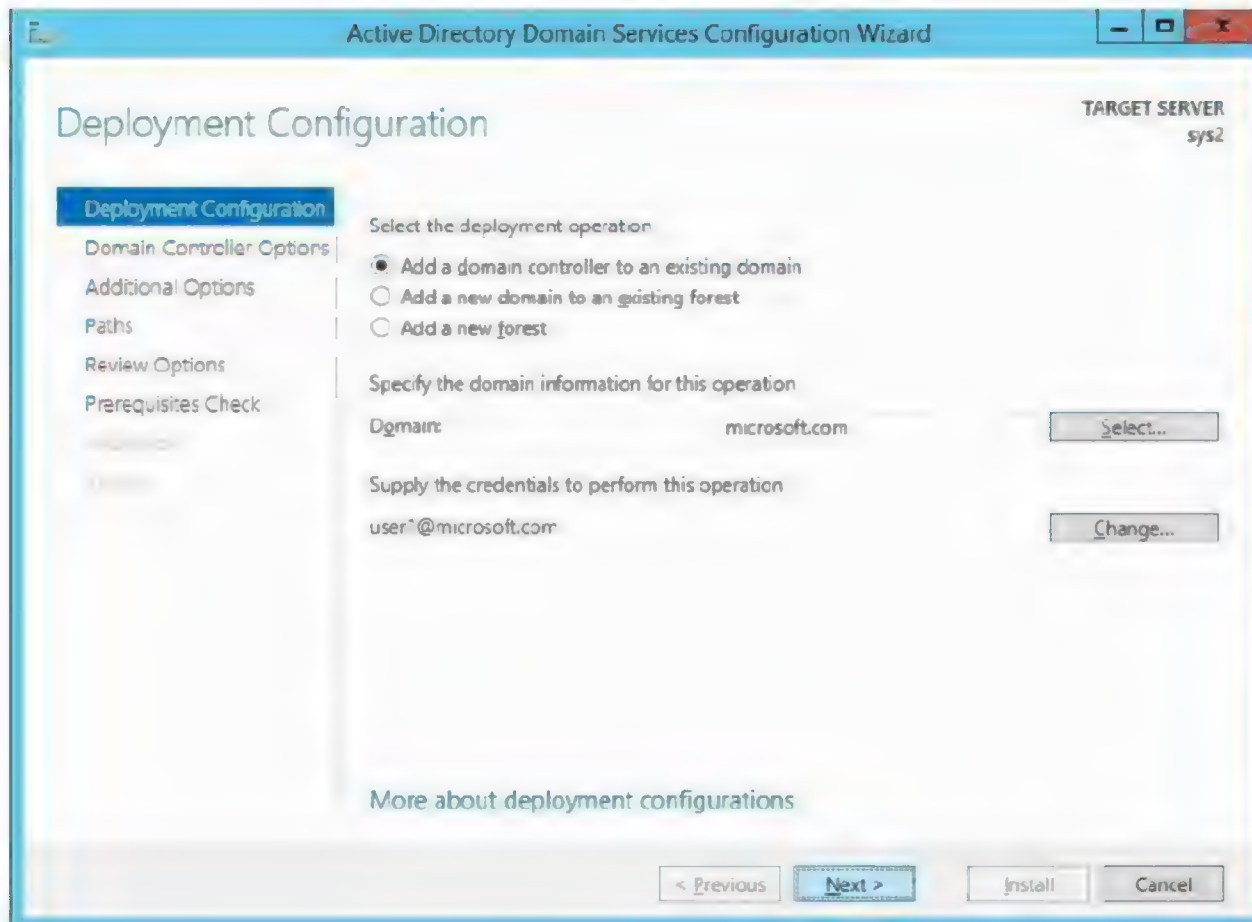
20. Check the box **Restart the destination server automatically if required**. Click **Install**.



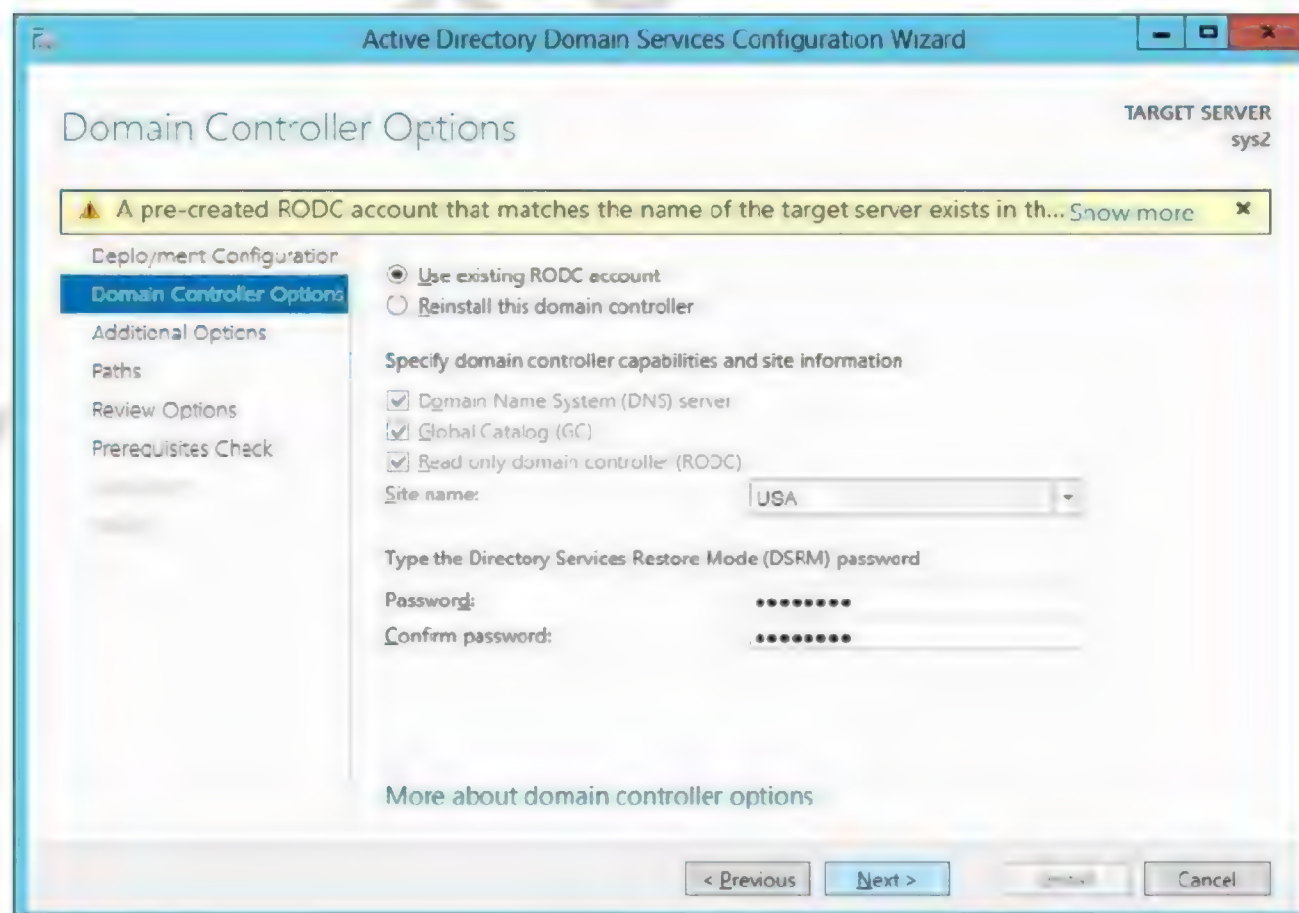
21. Click **Promote this server to a domain controller**.



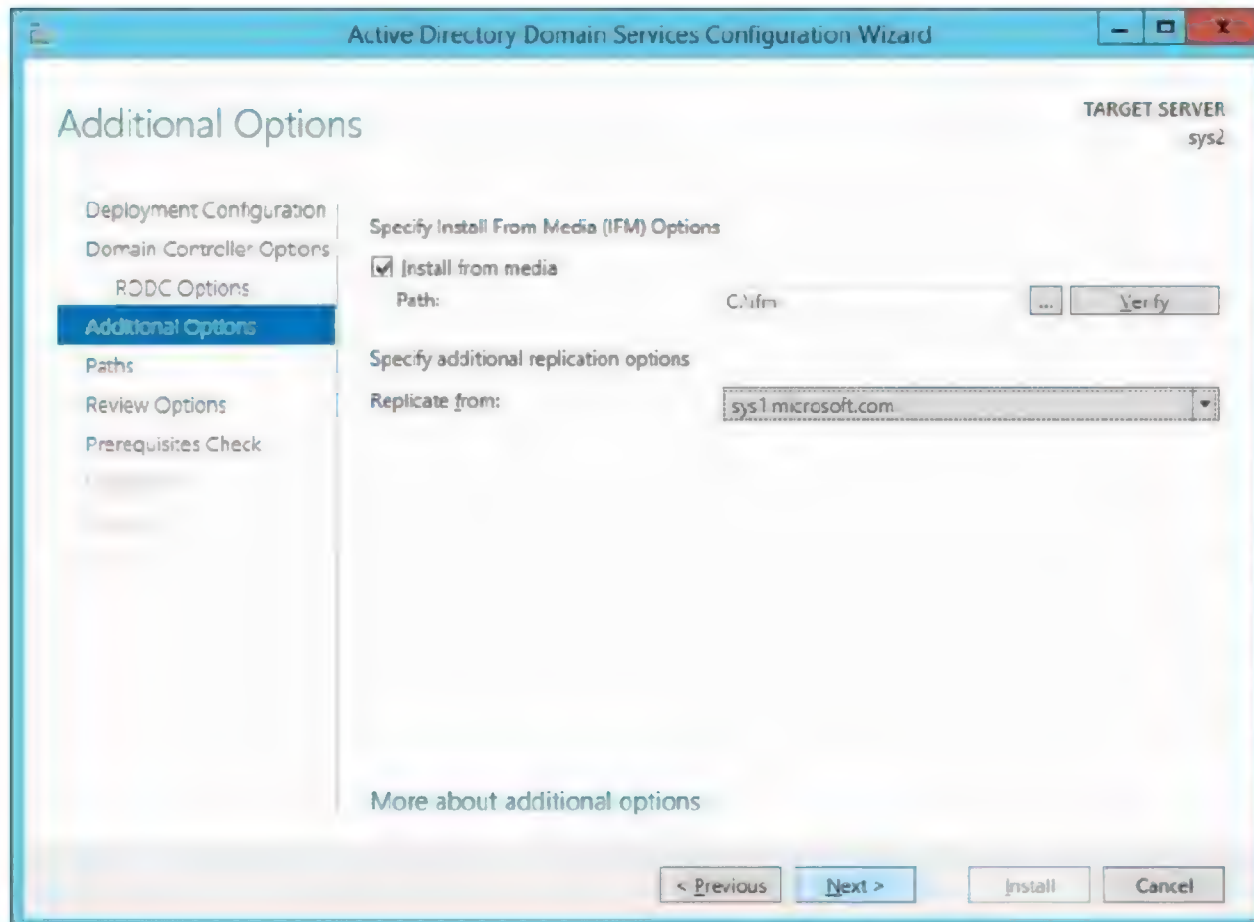
22. In Deployment Configuration wizard, select **Add a domain controller to an existing domain**, enter the Domain (Ex: **Microsoft.com**)
23. Click **Change**, enter User Name: user1@microsoft.com and Password, click **OK** → **Next**.



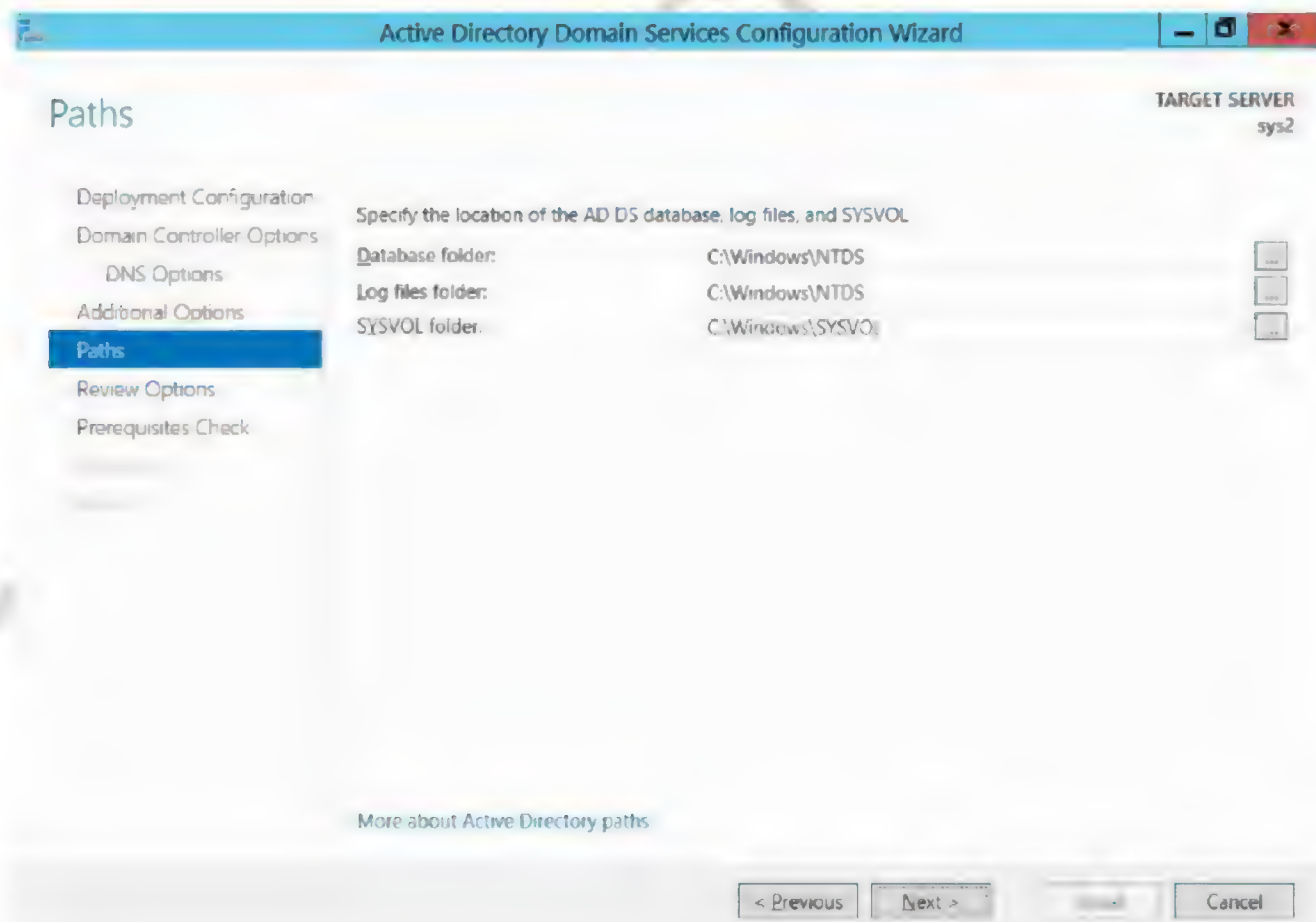
24. In Domain Controller Options, review the default settings, and type the Directory Services Restore Mode **Password** and **Confirm password** and click **Next**.



25. In Additional Options Page, check box Install from media, browse and select the folder C:\ifm→select Replicate from **Sys1.Microsoft.com**, click **Next**.

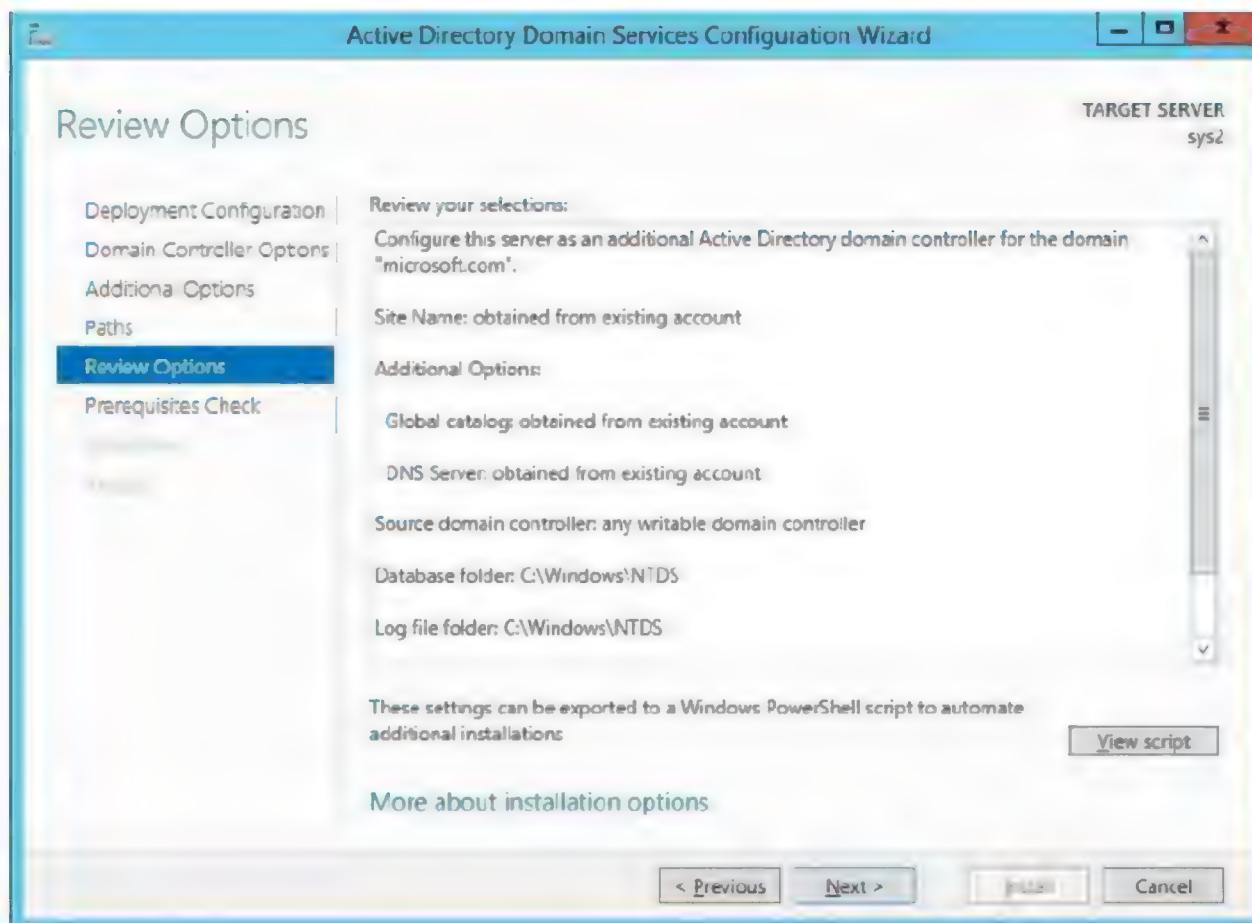


26. Verify the location of the AD DS database, log files, and SYSVOL, click **Next**.

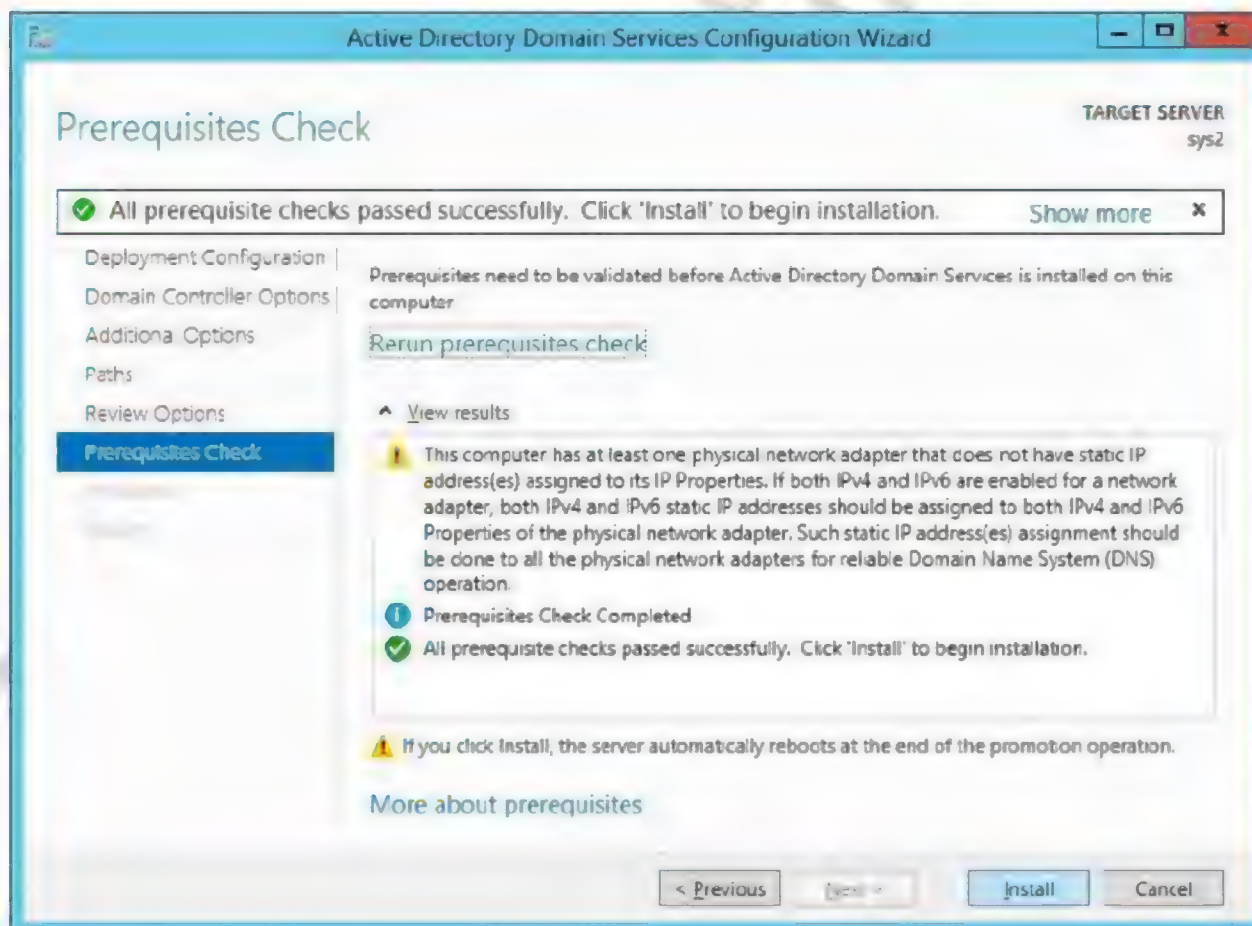




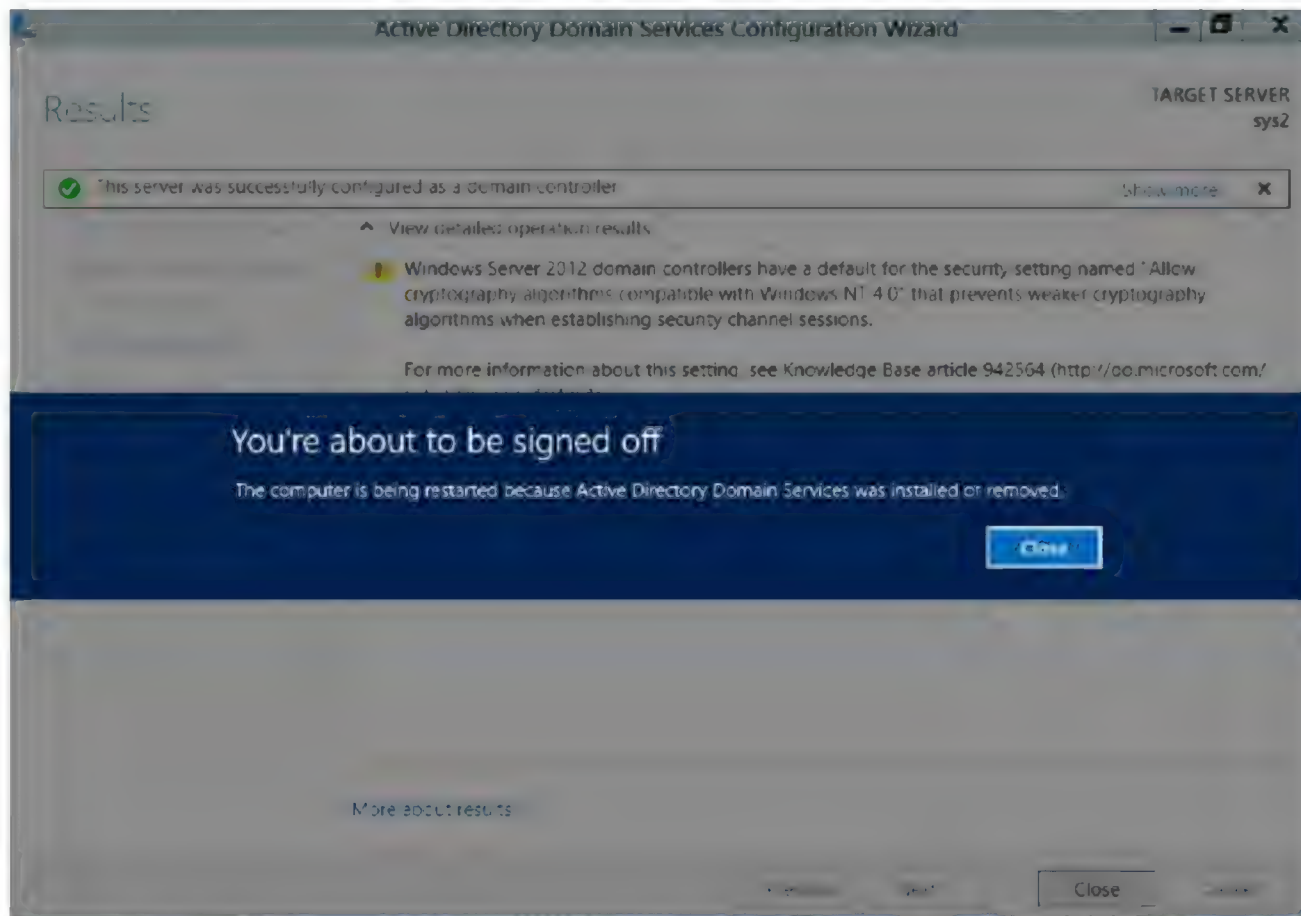
27. Review the Summary and click **Next**.



28. Click **Install** to begin installation.



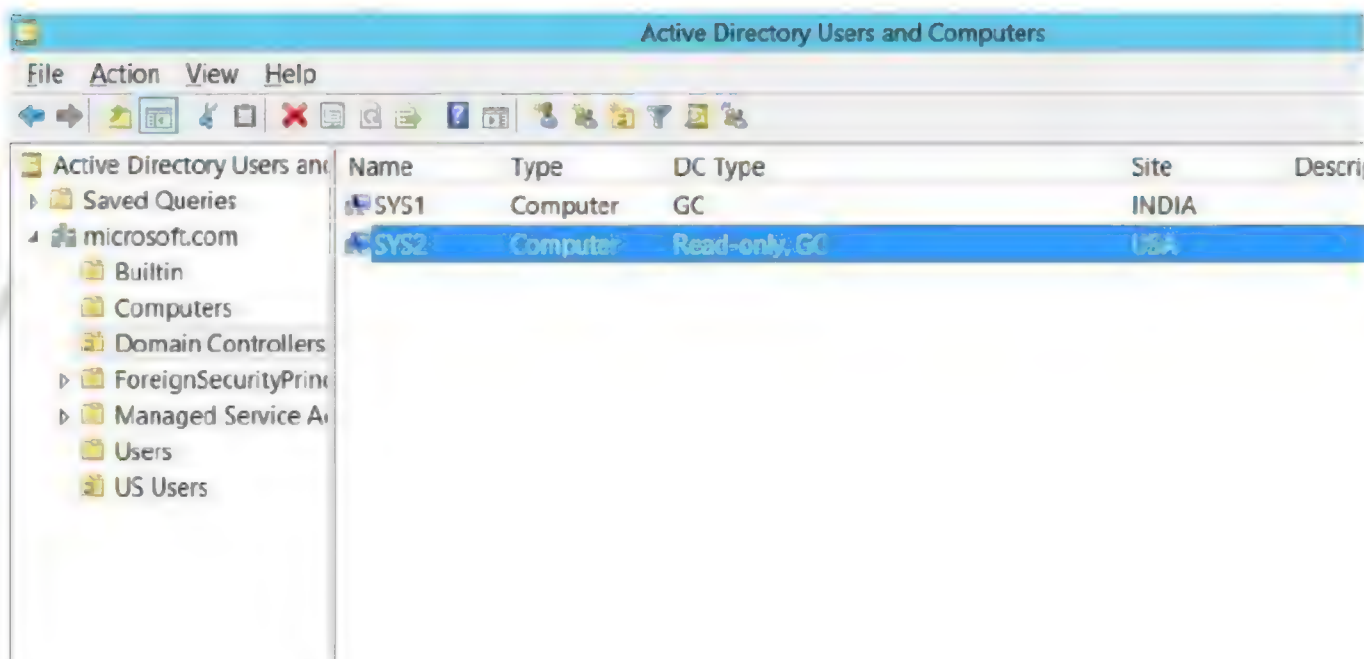
29. The computer restarts as a part of Active Directory Domain Services installation.



30. After restarting the computer **Active directory** will be installed.

**Verification:**

1. Log on to **Domain Controller (SYS1)** as **Administrator**
2. Go to Active Directory Users and Computer, Expand Domain Controllers OU and verify for **SYS2** as **Read Only Domain Controller**.



## Lab – 46: Installing and Configuring DHCP Server

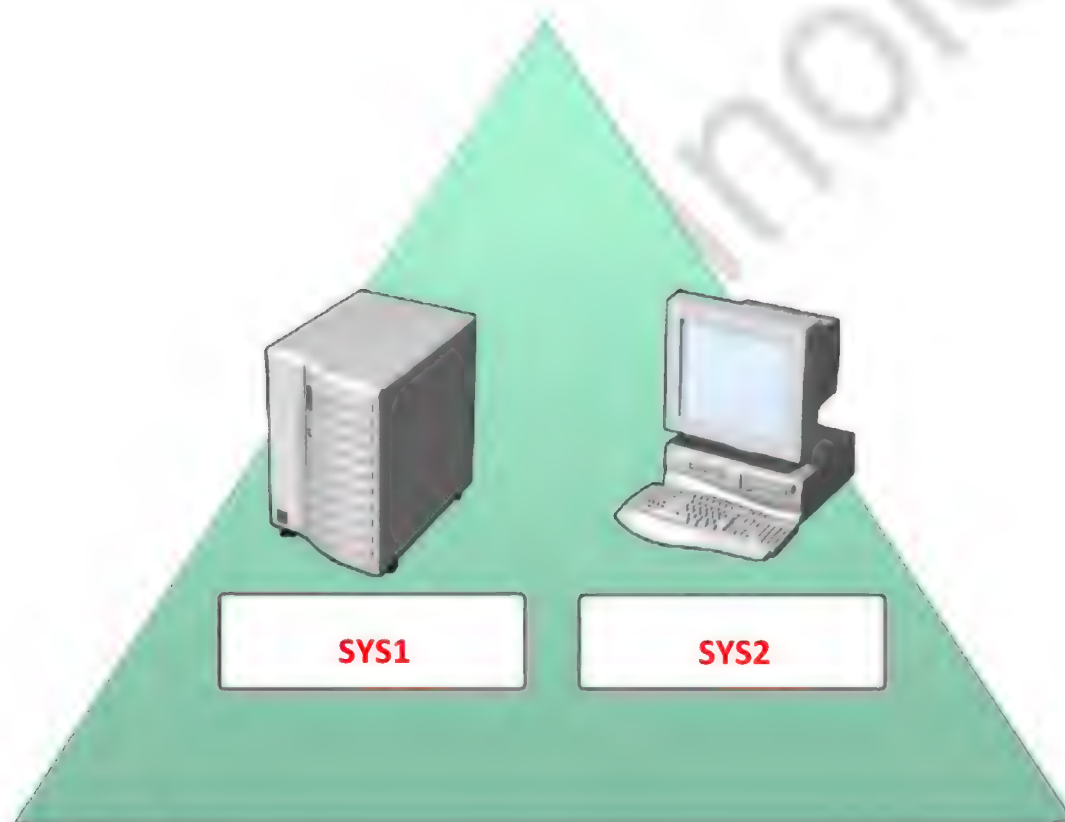
### Objective:

To automatically assign IP addresses to clients in a LAN with a DHCP server

**Pre-requisites:** Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

**Domain Controller / DHCP Server**

IP Address      10.0.0.1

Subnet Mask      255.0.0.0

Preferred DNS      10.0.0.1

#### SYS2

**Member Server / Client**

IP Address

Subnet Mask

Preferred DNS



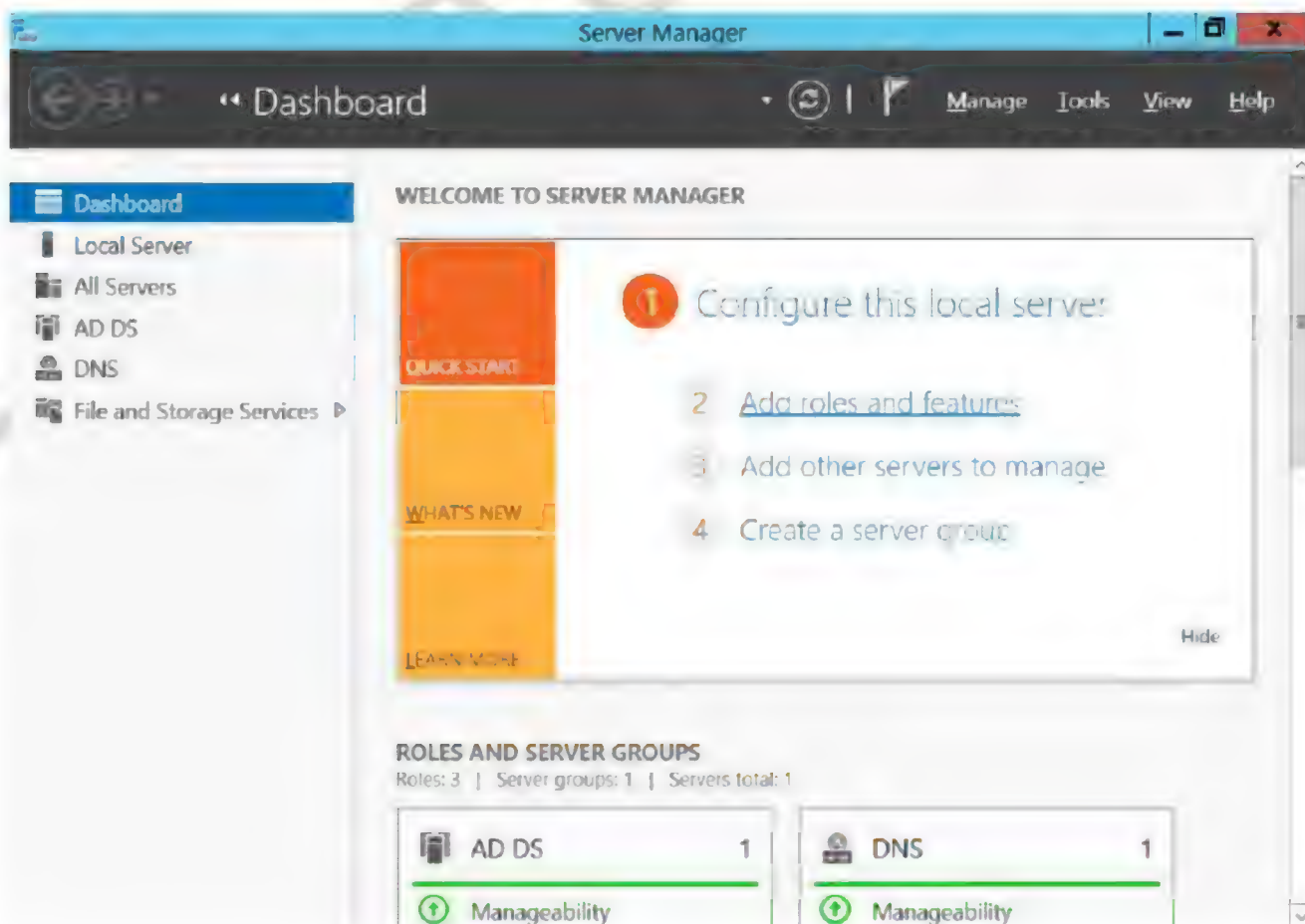
## Installing DHCP Service

### SYS1 - CONFIGURATION

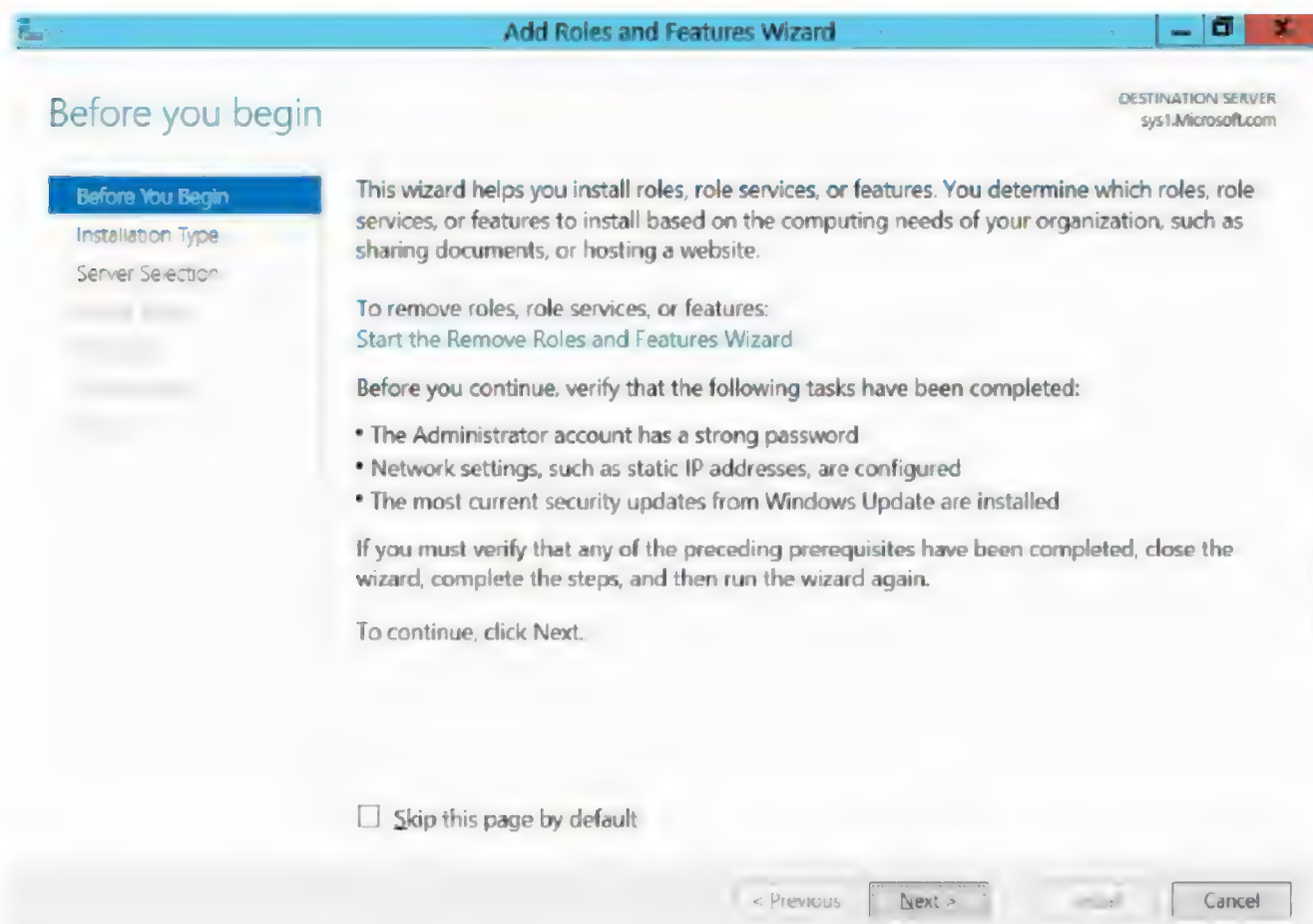
1. Click **Server Manager**.



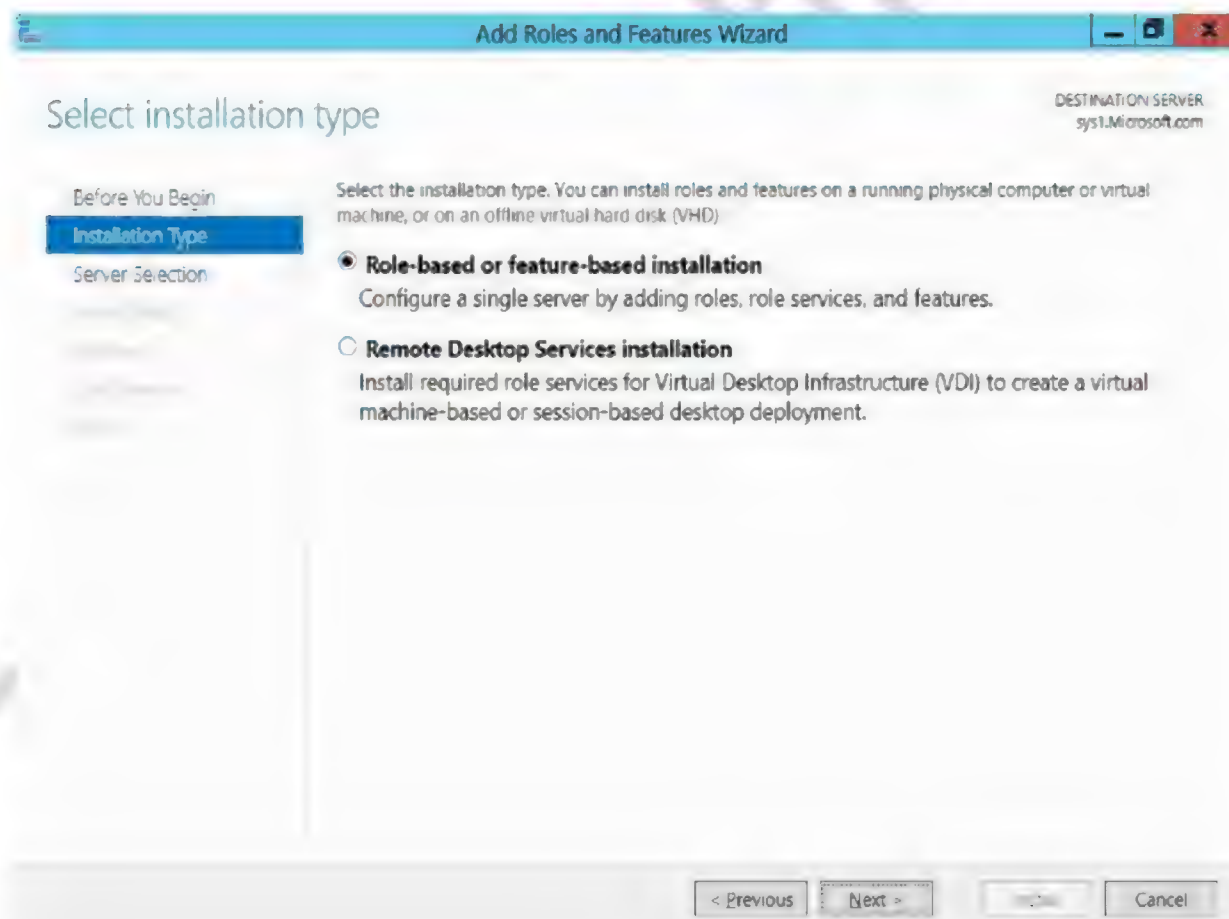
2. In the Server Manager Console, Select **Add roles and features**



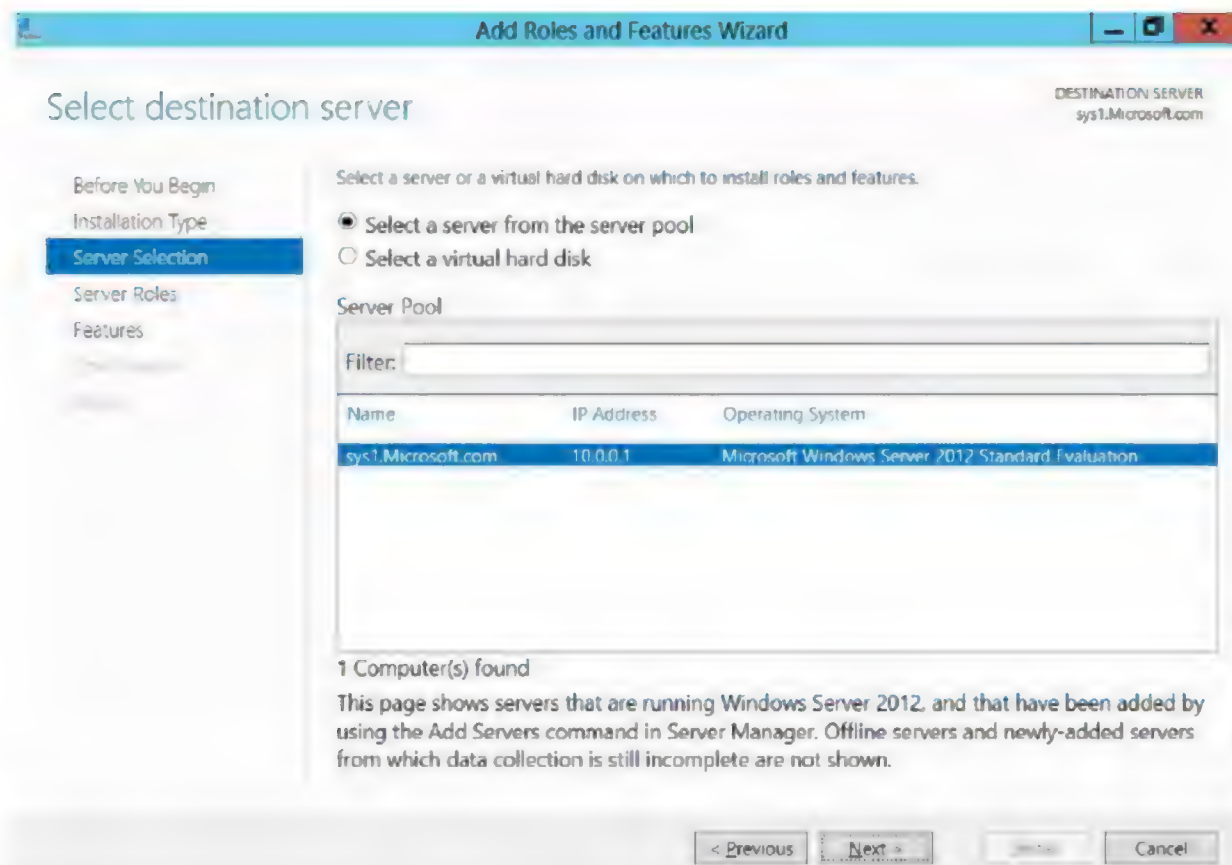
3. In before you begin page, click **Next**.



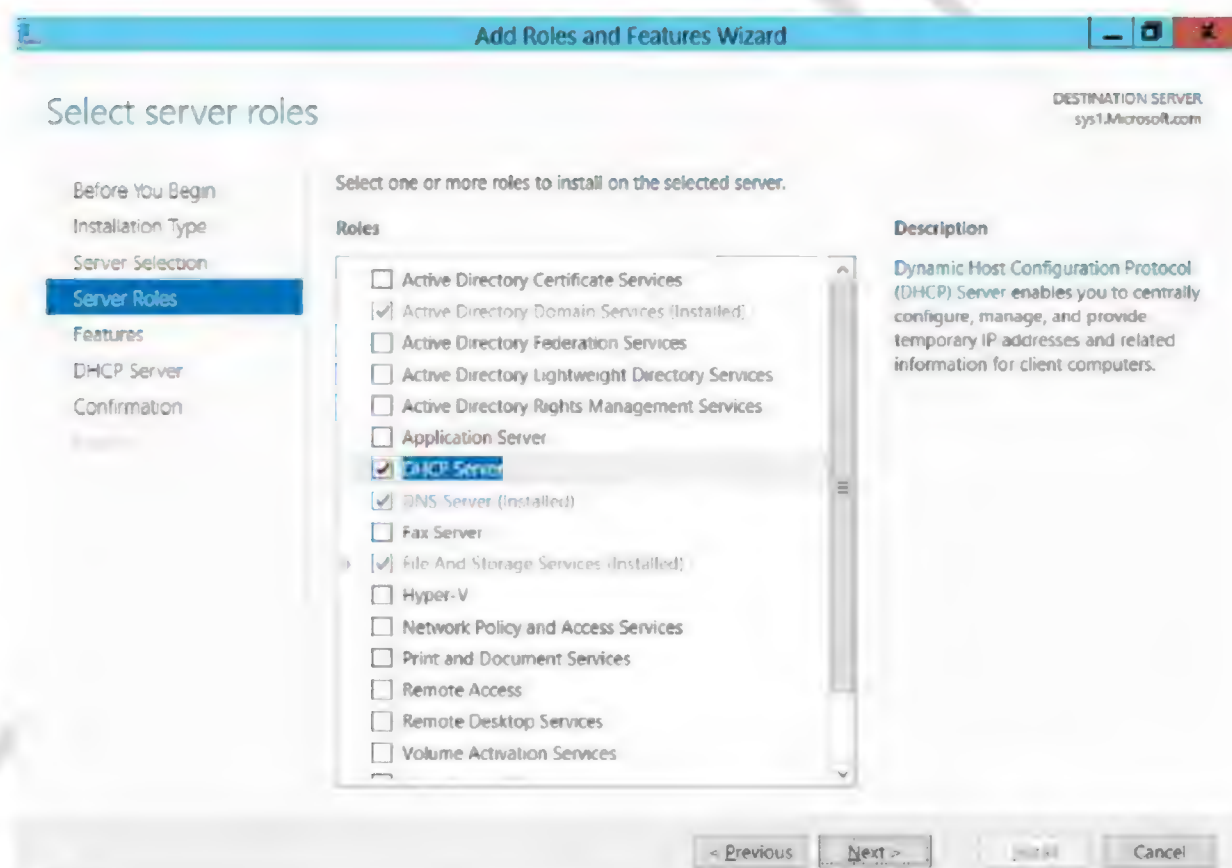
4. Select **Role-based or feature-based installation**, click **Next**.



5. Select a server (**sys1.Microsoft.com**) from the server pool and click **Next**.

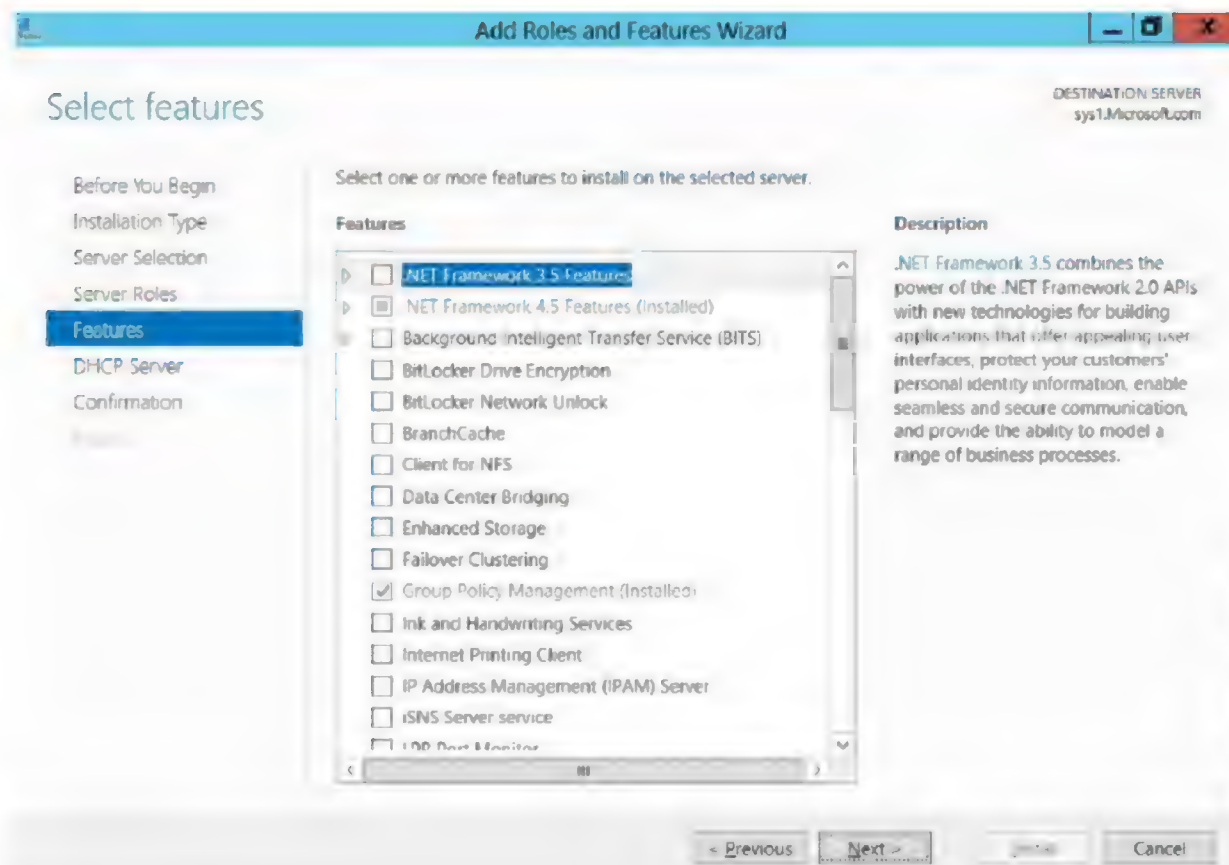


6. In select server roles, check the box DHCP Server and click **Next**.

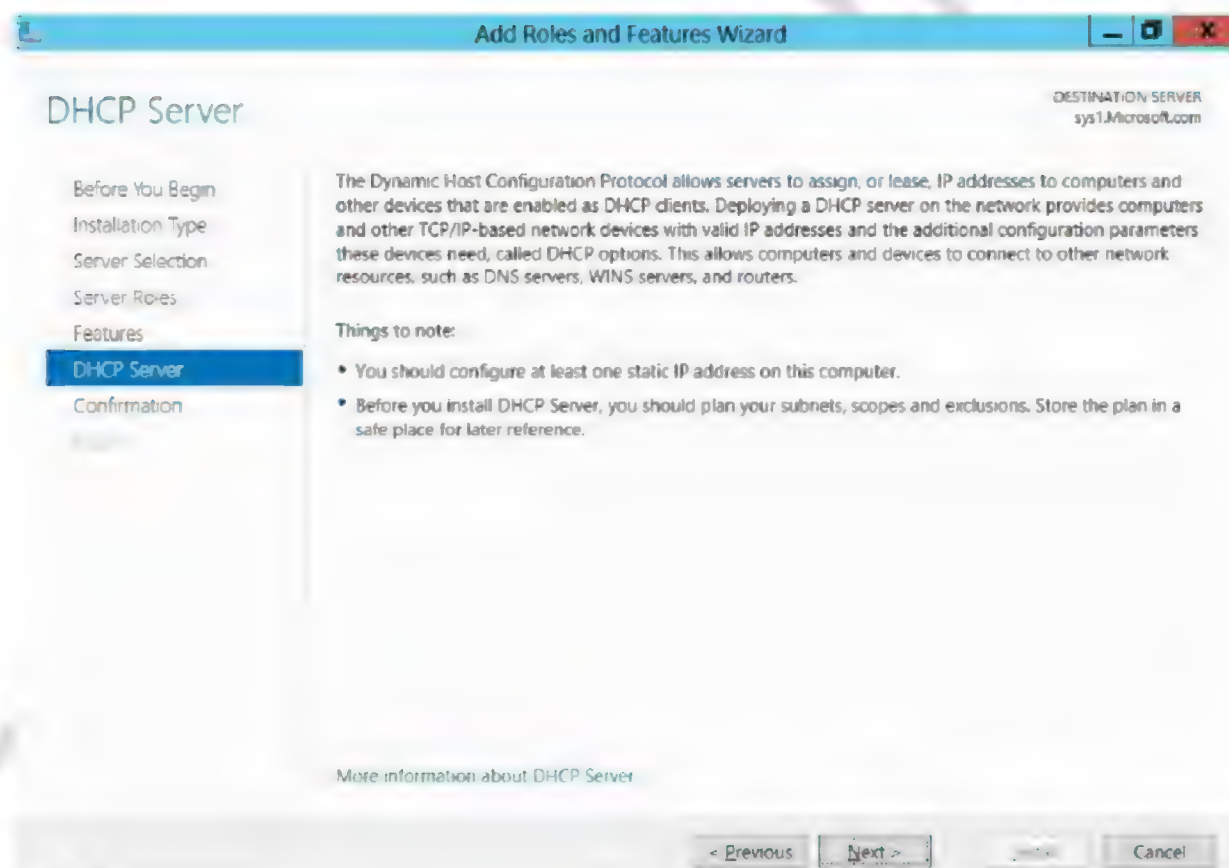




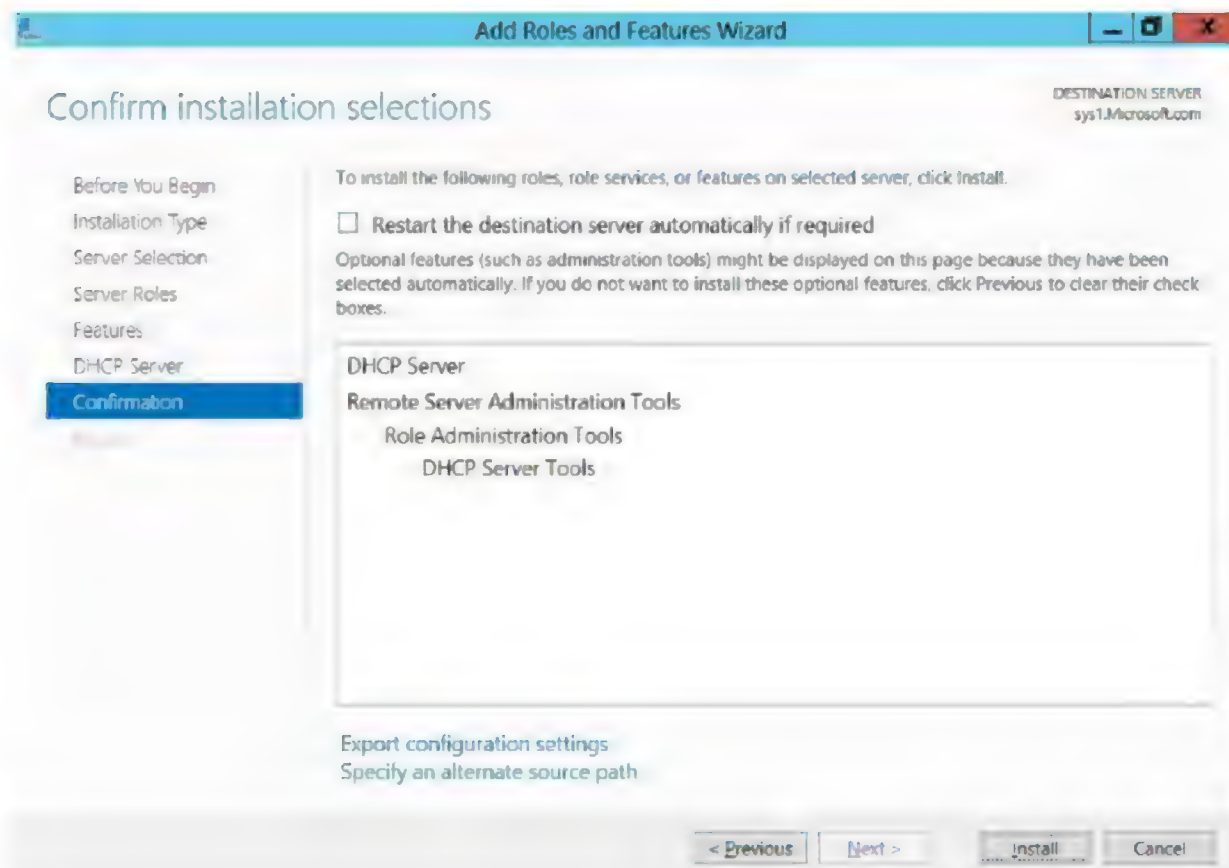
7. In select features, click **Next**.



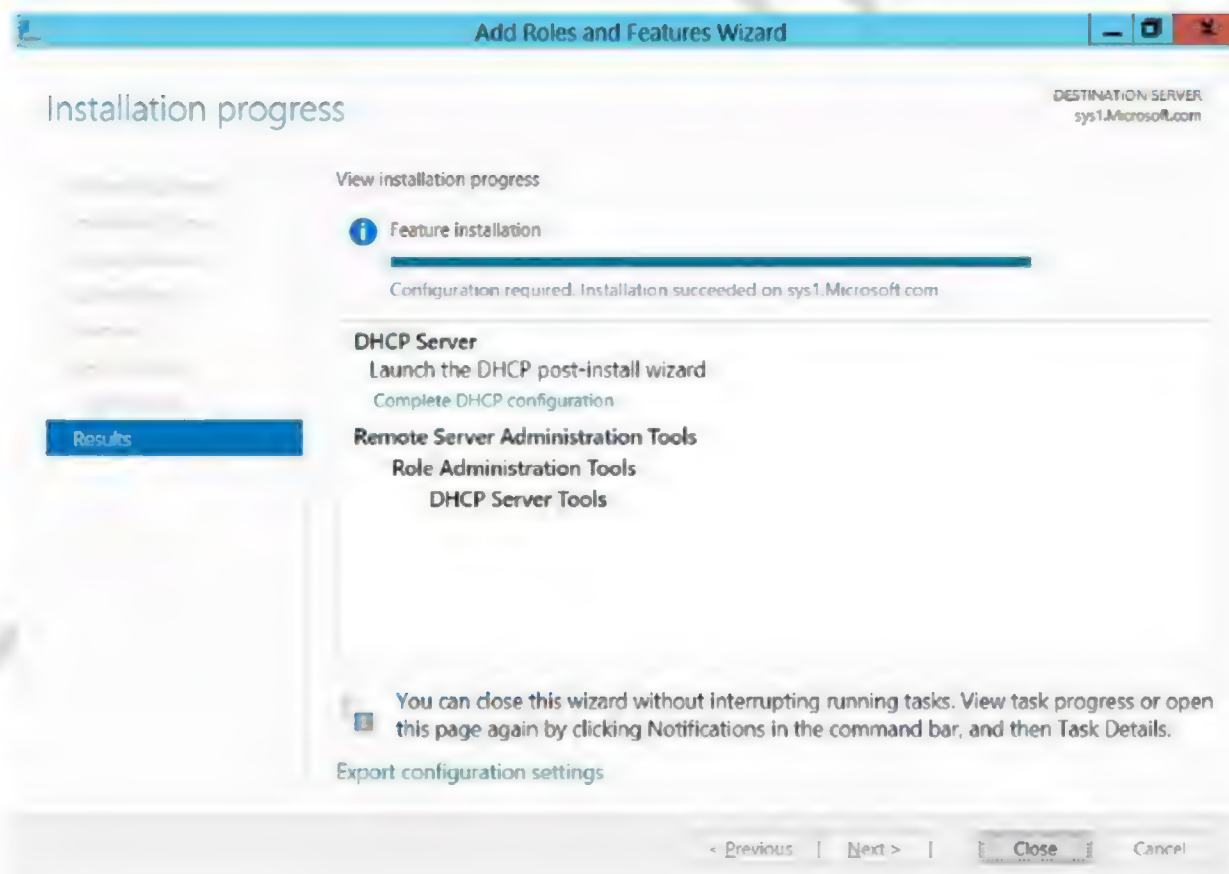
8. Click **Next**.



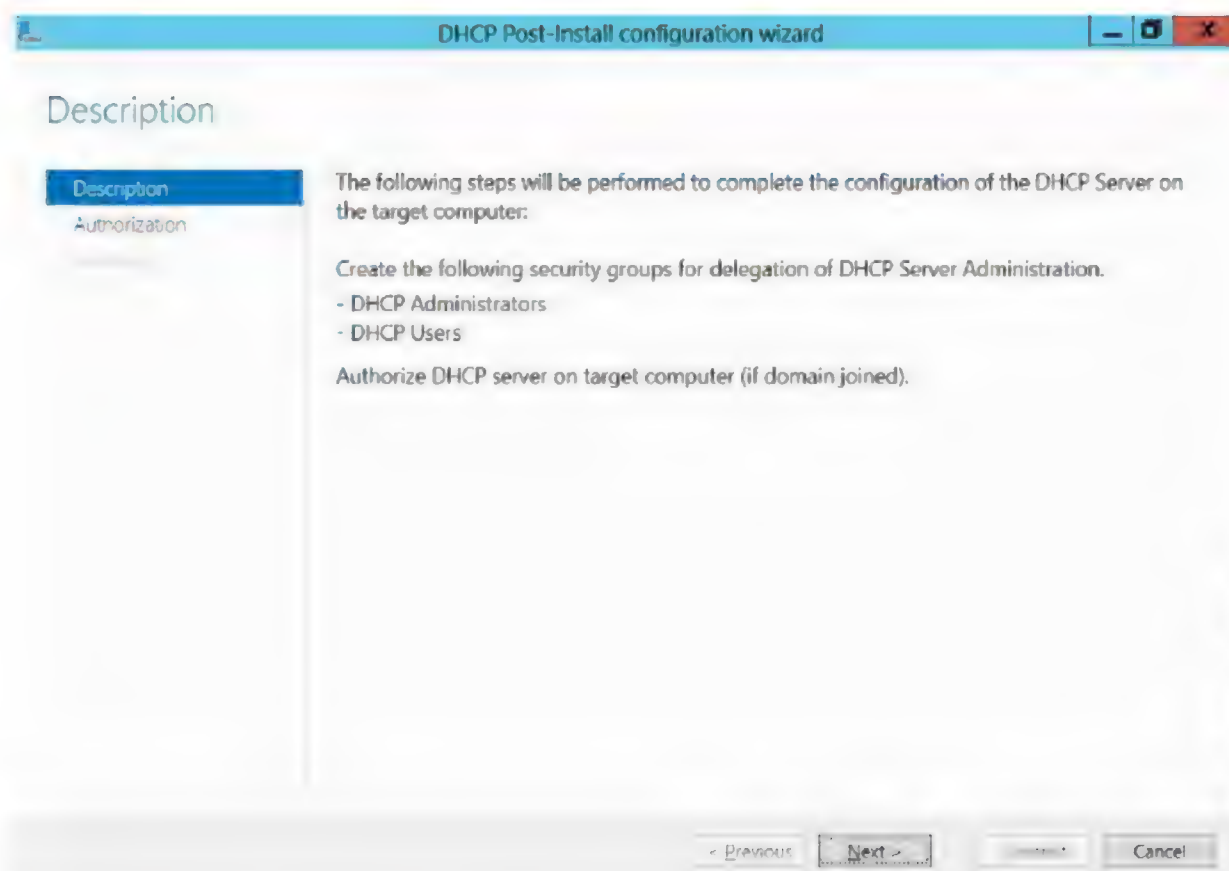
- Check Restart the destination server automatically if required and click **Install**.



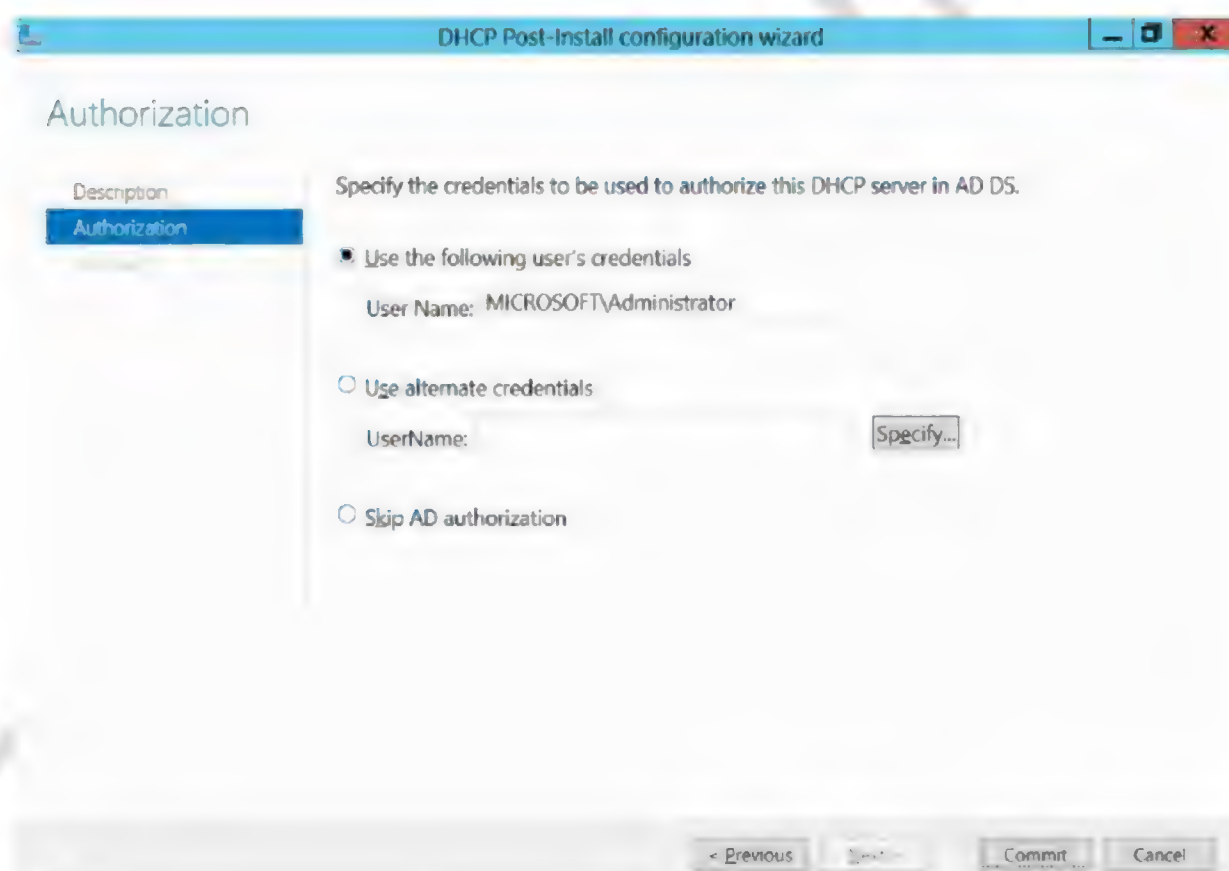
- Select **Complete DHCP configuration**.



11. In DHCP Post-install configuration wizard, click **Next**.



12. Click **Commit** to Authorize the DHCP Server.

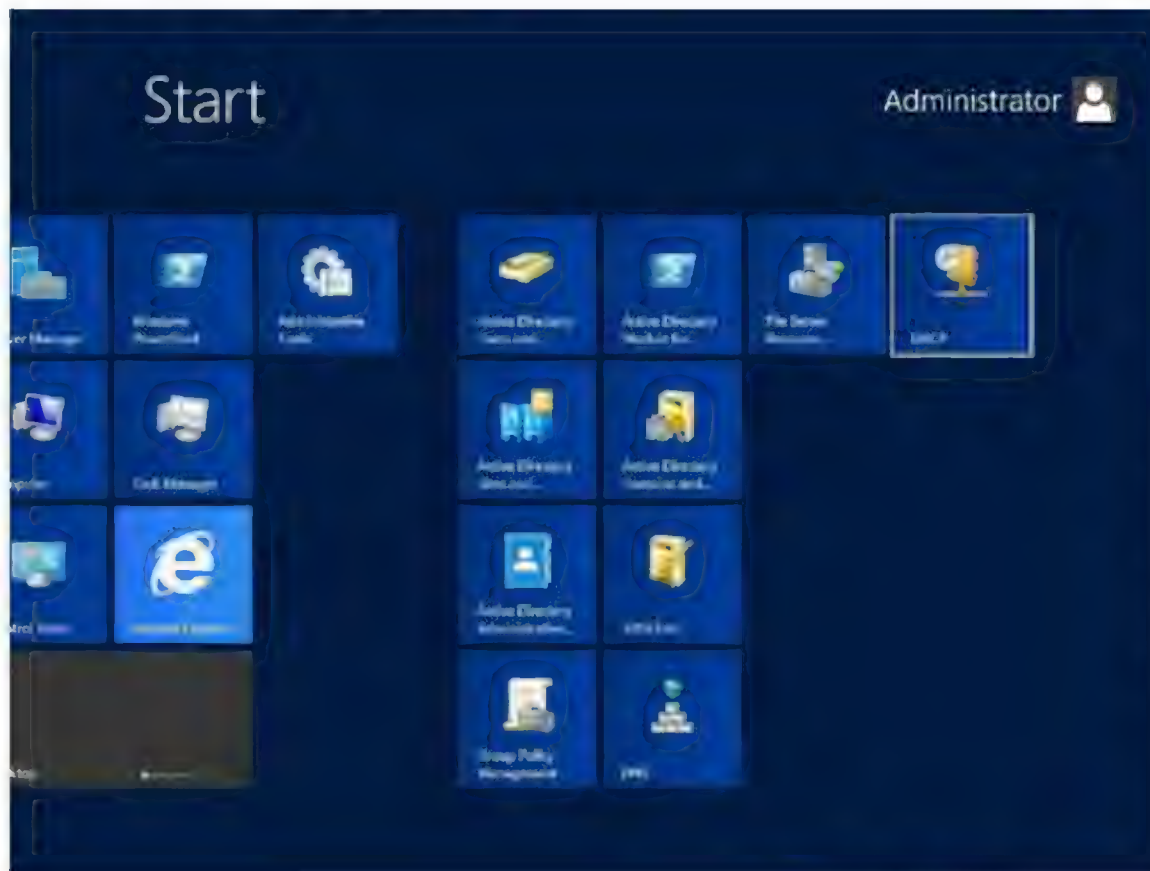


13. Click **Close** to Complete the Authorization of DHCP Server.

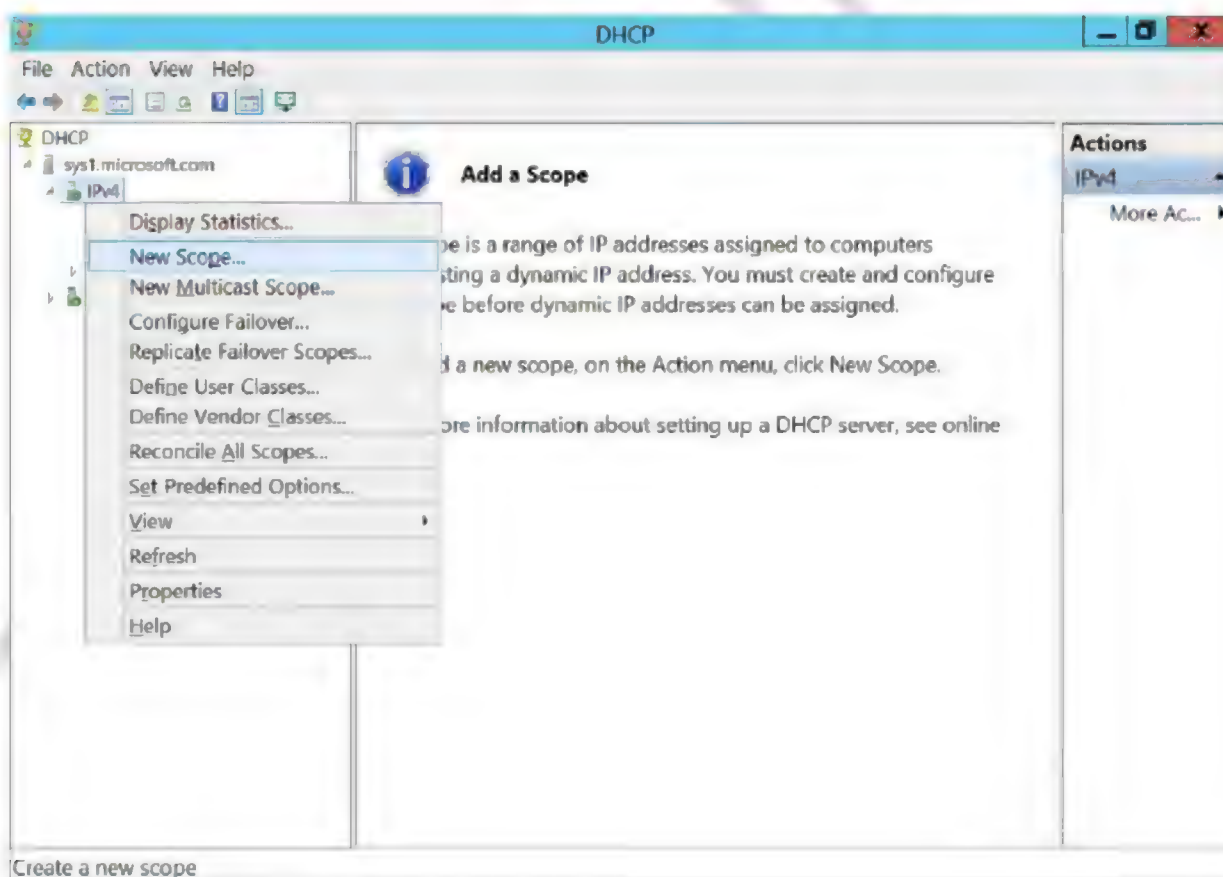


## Creating a scope

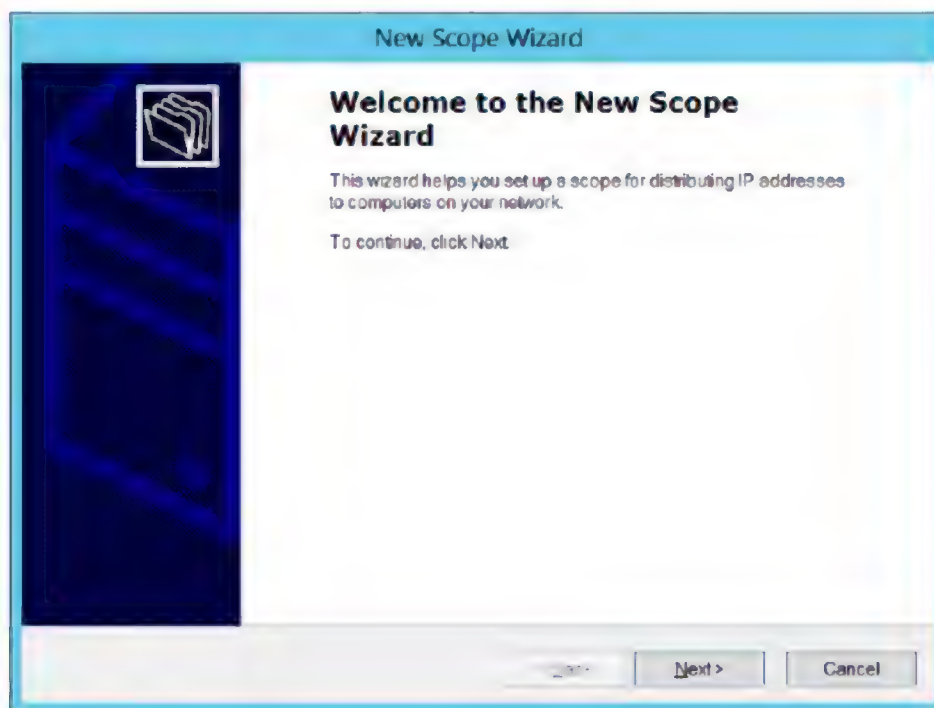
1. Go to Start, select **DHCP**.



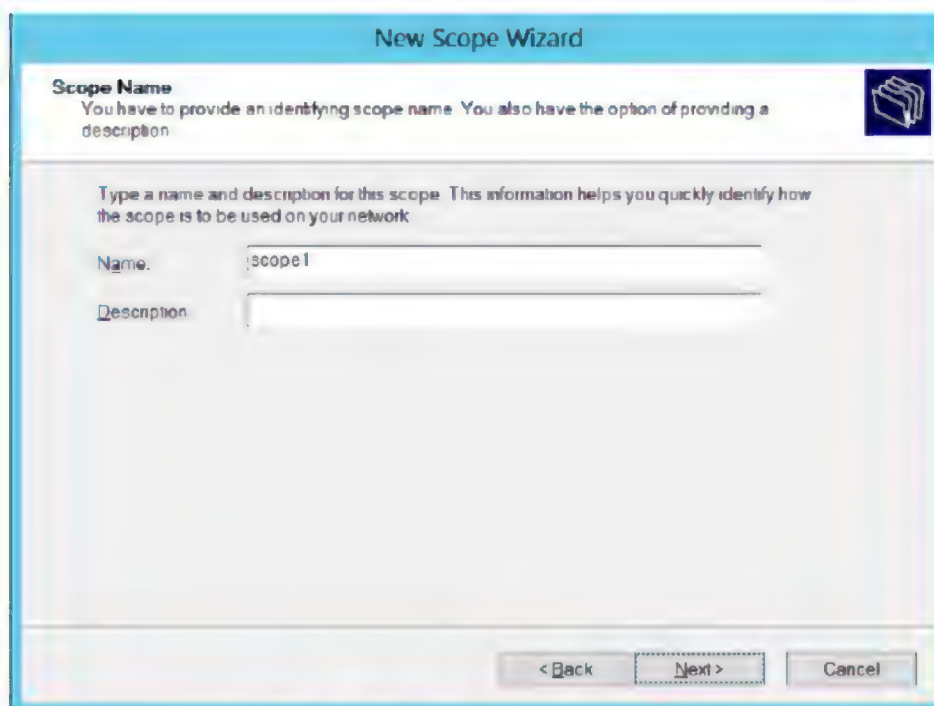
2. Expand the System name → right click IPv4 → select **New Scope**



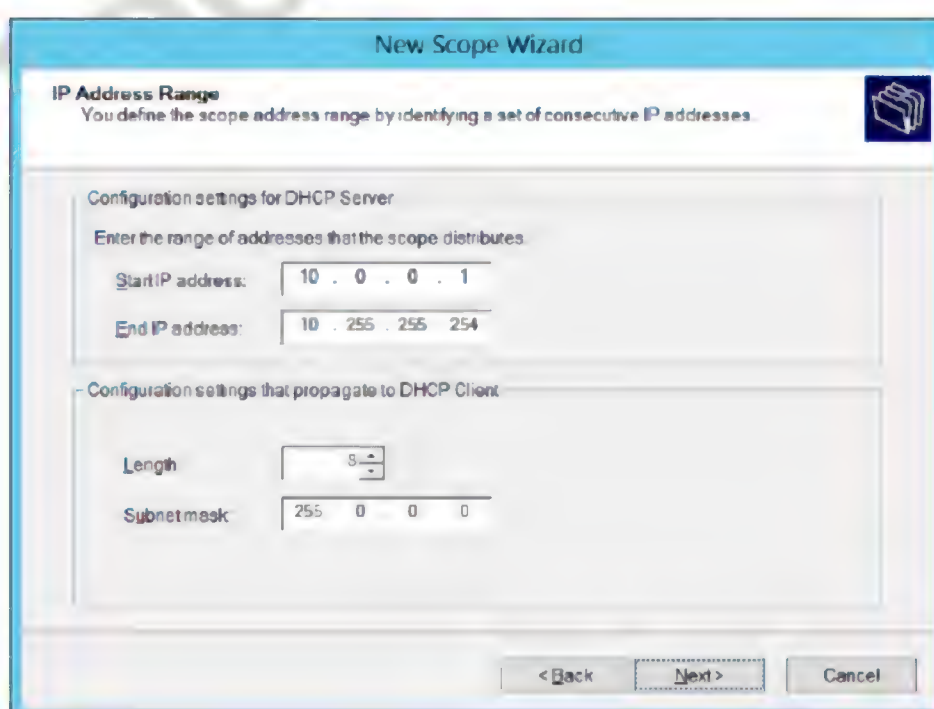
3. The New Scope wizard starts, click **Next**.



4. Enter **Name** and a **Description** for the scope and click **Next**.



5. Enter the IP Address Range to be leased to clients, click **Next**.



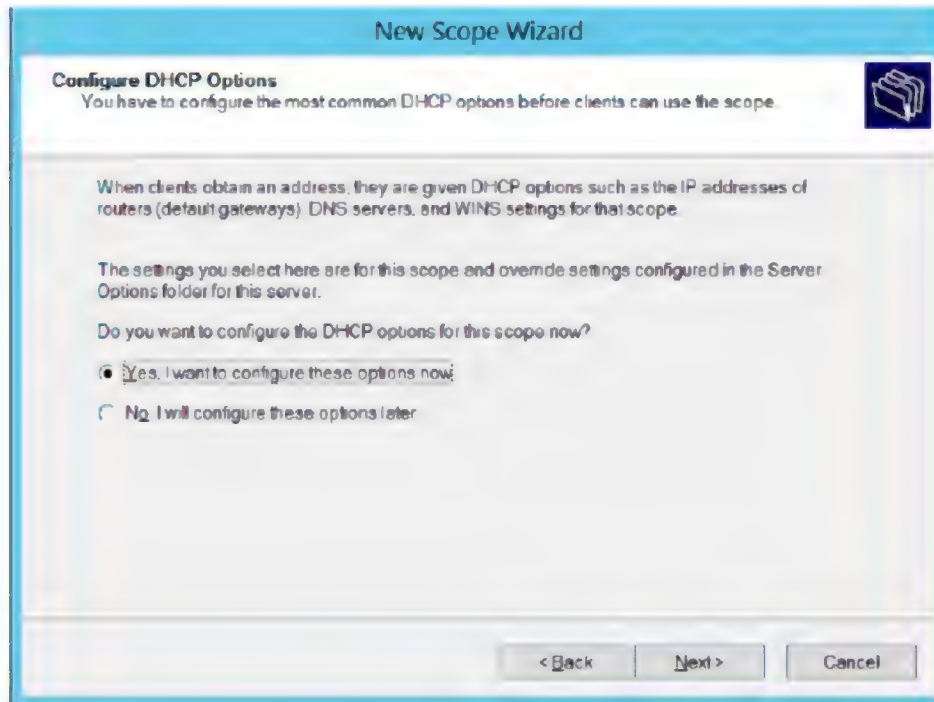
**Note:** Mention the scope range in the same network of DHCP server.

6. To exclude IP addresses, enter the **Start and end IP address**, click **Add**. Click **Next**.

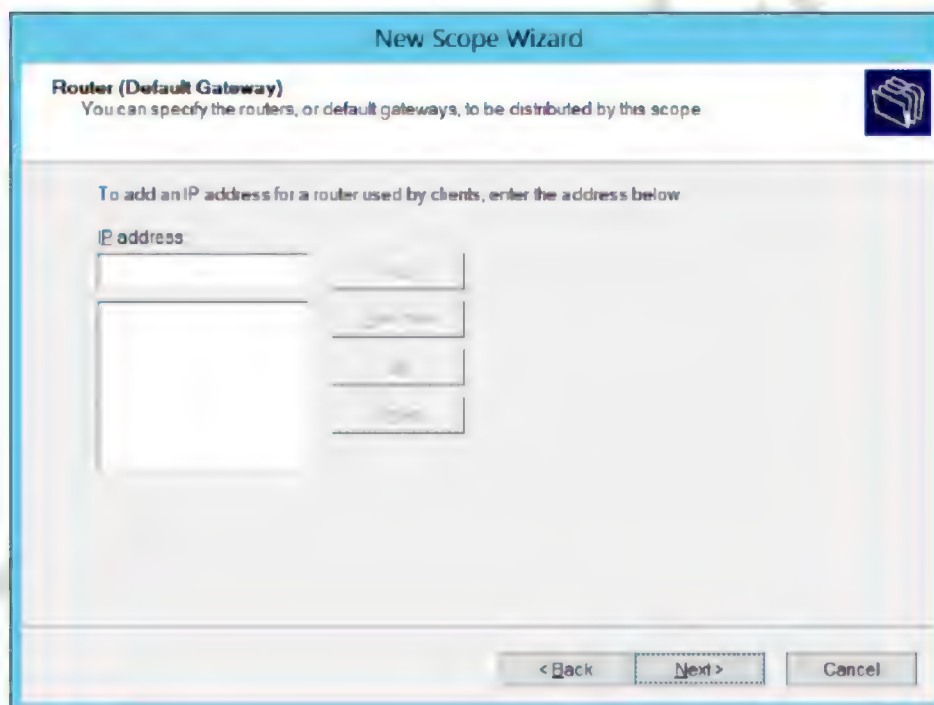
7. In the **Lease Duration** screen, you can Increase or Decrease the value, click **Next**.



8. In the Configure DHCP Options screen, choose **Yes**, to configure DHCP options for this scope (such as routers, DNS, and WINS settings) now. Click **Next**.



9. In the **Router (Default Gateway)** screen, enter the IP address of the **router** that will function as the **default gateway** for this scope clients and click **Add**. Or, if you don't have a **Router** in your network, just click **Next**.



10. In the **Domain Name** and **DNS Servers** screen enter the name of the Parent Domain & IP address of the DNS server, click **Add** → click **Next**.

**New Scope Wizard**

**Domain Name and DNS Servers**  
The Domain Name System (DNS) maps and translates domain names used by clients on your network.

You can specify the parent domain you want the client computers on your network to use for DNS name resolution.

Parent domain:

To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.

Server name:	IP address:	
<input type="text"/>	<input type="text" value="10.0.0.1"/>	<input type="button" value="Add"/>
<input type="button" value="Resolve"/>		<input type="button" value="Remove"/>
		<input type="button" value="Up"/>
		<input type="button" value="Down"/>

< Back   Next >   Cancel

11. In the **WINS Servers** screen enter the IP address of the WINS server, click **Add** click **Next**, if you don't have a WINS server on your network, just click **Next**.

**New Scope Wizard**

**WINS Servers**  
Computers running Windows can use WINS servers to convert NetBIOS computer names to IP addresses.

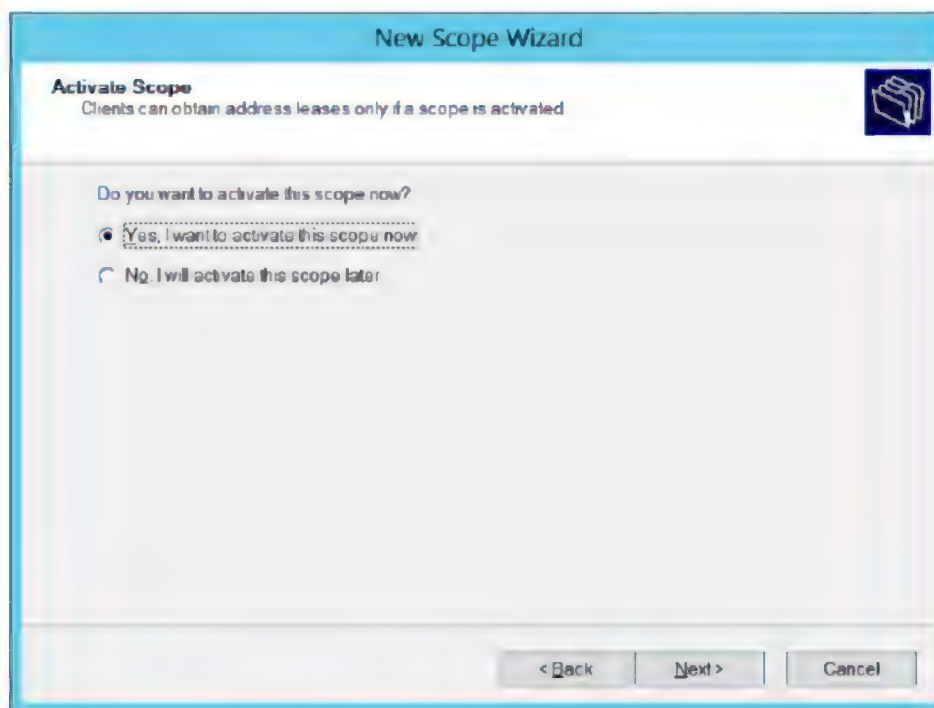
Entering server IP addresses here enables Windows clients to query WINS before they use broadcasts to register and resolve NetBIOS names.

Server name:	IP address:	
<input type="text"/>	<input type="text"/>	<input type="button" value="Add"/>
<input type="button" value="Resolve"/>		<input type="button" value="Remove"/>
		<input type="button" value="Up"/>
		<input type="button" value="Down"/>

To change this behavior for Windows DHCP clients modify option 046, WINS/NBT Node Type, in Scope Options.

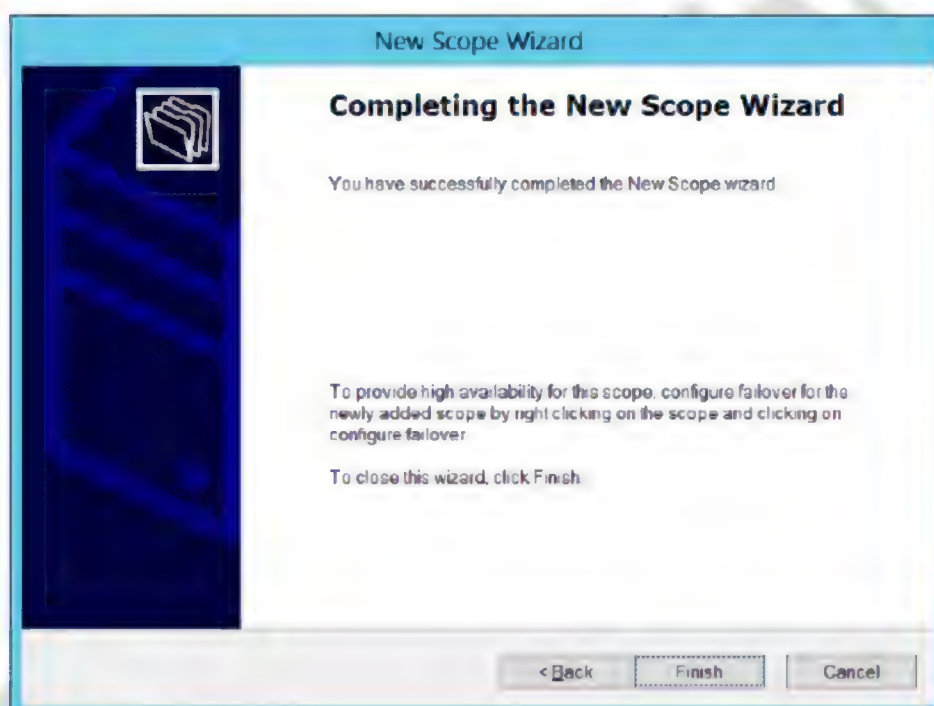
< Back   Next >   Cancel

12. In the Activate Scope screen, select **YES** and click **Next**.



**Note:** A DHCP server can't assign IP addresses until the scope is activated.

13. Click **Finish** to complete the creation of Scope.

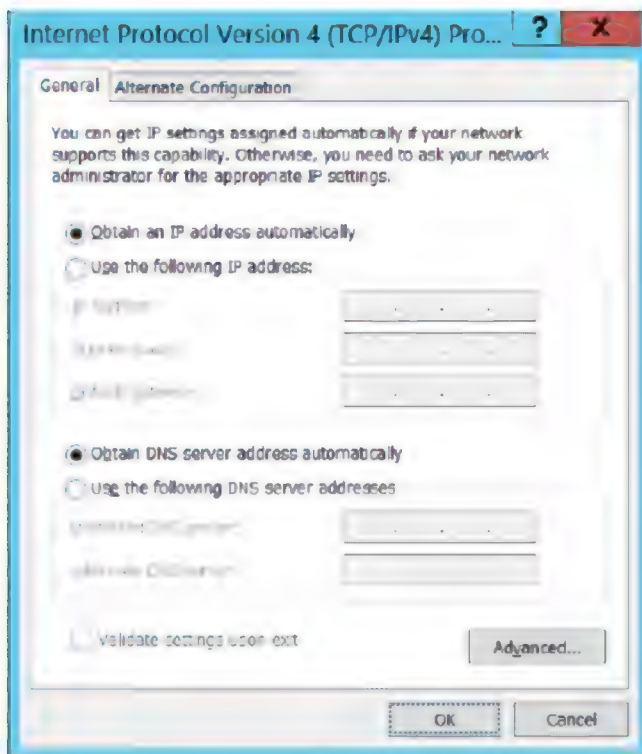




## SYS2 - CONFIGURATION

### Verification: In DHCP Client

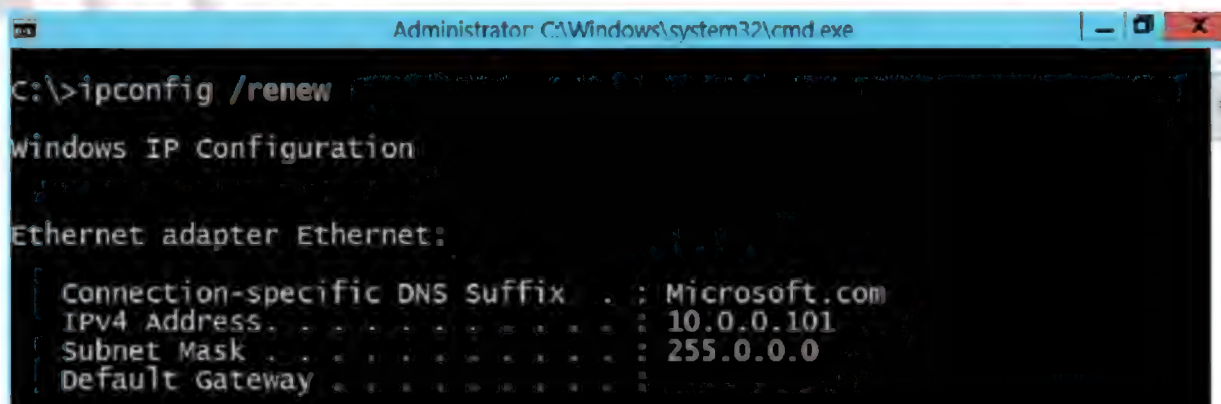
1. Right click network Icon → Select properties → click View Status and select properties → Select Internet protocol Version 4 (TCP/IPv4) Properties and select **Obtain an IP Address automatically** and **Obtain an DNS Server Address Automatically** → OK



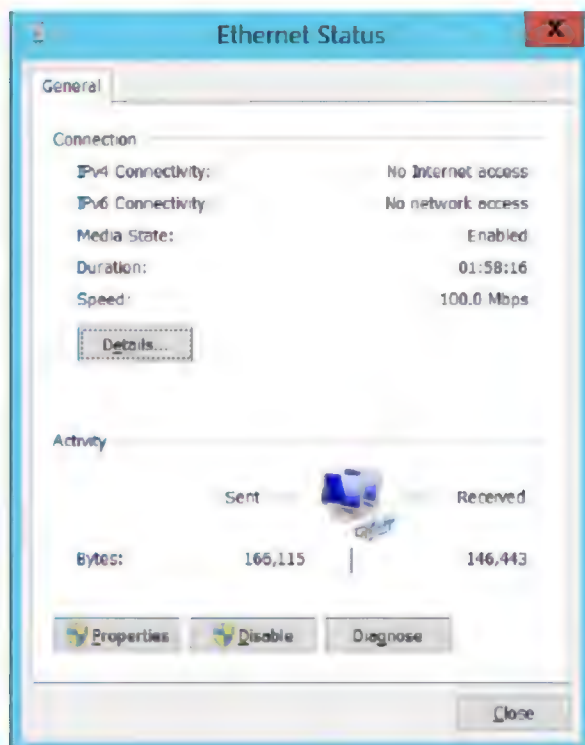
2. Open the **Command Prompt** → and type **Ipconfig /release**



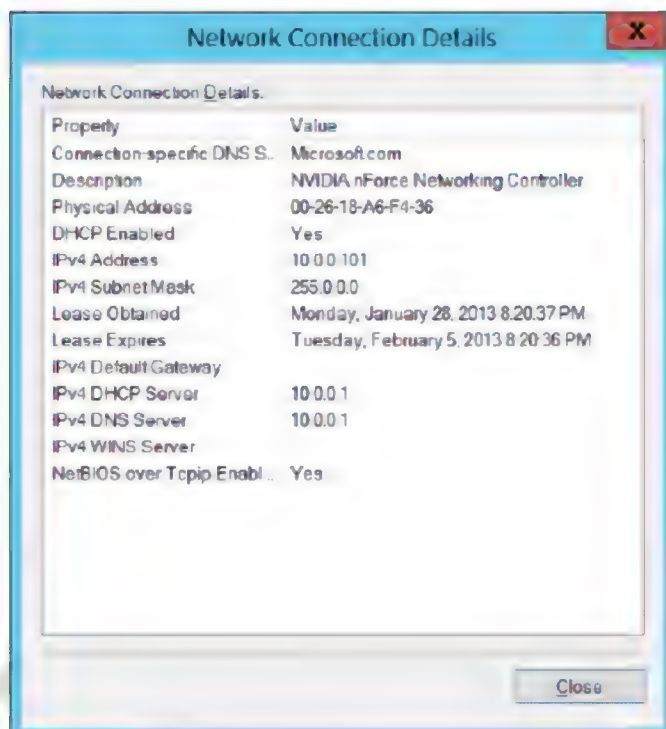
3. Then type **Ipconfig/renew**



4. After that Right click on network Icon → Select properties → click View Status and click **Details**.



5. Verify the IP Address leased by the DHCP Server along with the lease duration and DHCP Server and DNS Server details.



## Lab – 47: Creating DHCP Reservations

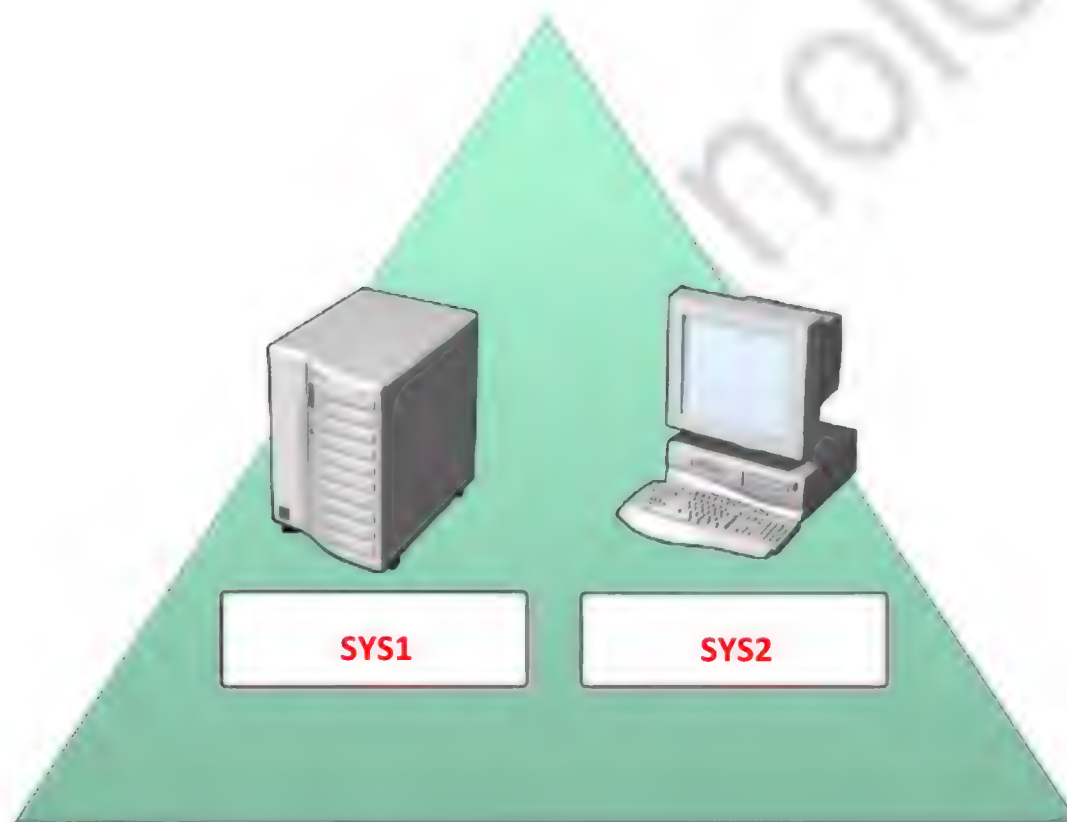
### Objective:

To reserve an IP address for a client using a DHCP server

**Pre-requisites:** Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

**Domain Controller / DHCP Server**

IP Address      10.0.0.1  
Subnet Mask      255.0.0.0  
Preferred DNS      10.0.0.1

#### SYS2

**Member Server / Client**

IP Address  
Subnet Mask  
Preferred DNS

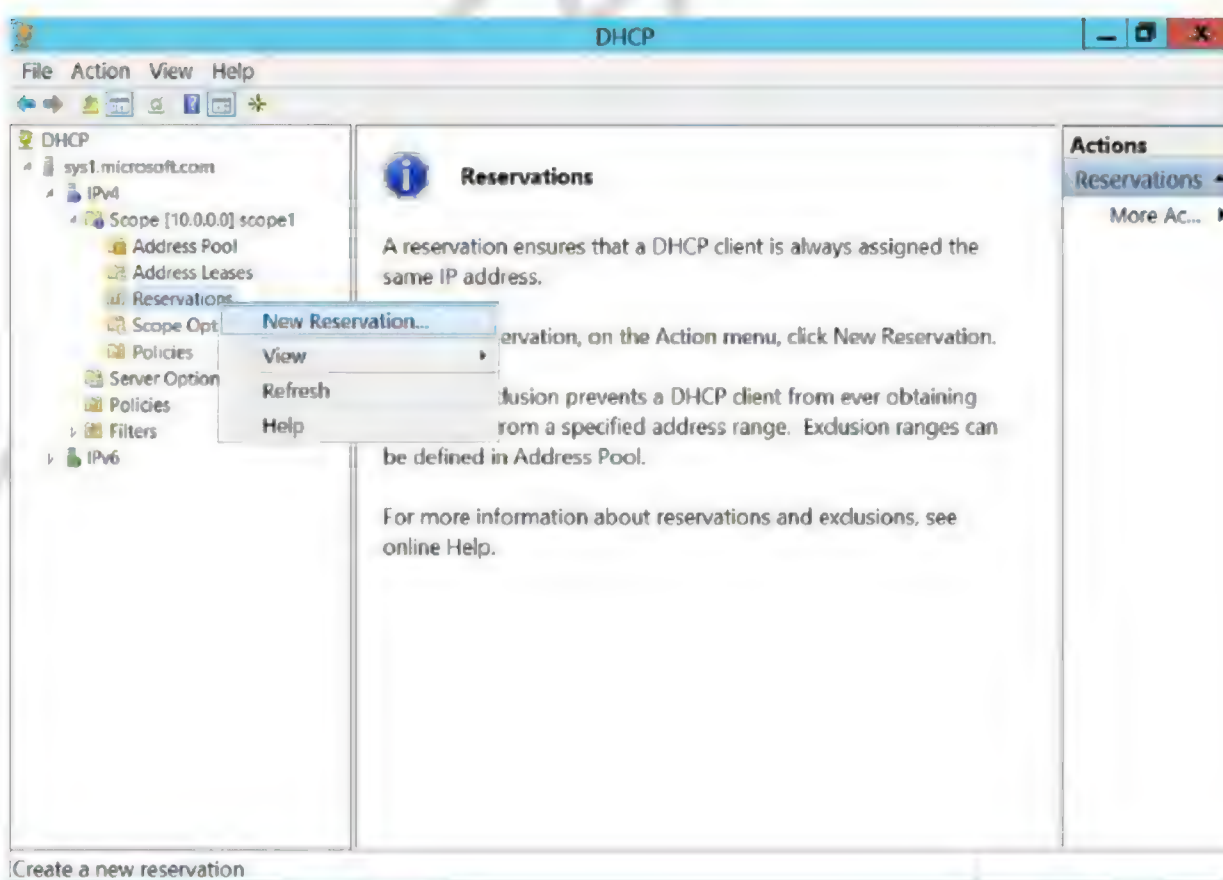


## SYS1 - CONFIGURATION

1. Go to Start, select **DHCP**.



2. In the left pane of the DHCP Console, expand the Scope → Right click **Reservation** → Select **New Reservation**



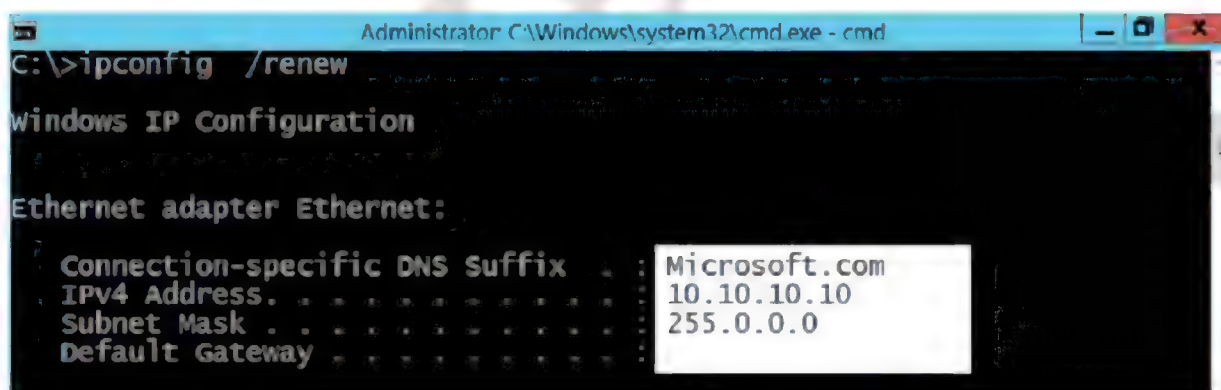
3. Type in a name for the reservation in the **“Reservation name”** text box. Then, in the **“IP address”** text box, mention the IP address that you want to be reserved. Then, enter the MAC address of the network adapter of the computer for which the reservation is being made in the box provided → click **add** → click **Close**.

**Note:** To Know the MAC or Physical address of the client type **Ipconfig /all** or **getmac** in command prompt of client computer.



**Check the output in the client computer (SYS2).**

1. In the command prompt type **Ipconfig /release** and **Ipconfig /renew**.



## Lab – 48: DHCP Server Backup and Restore

### Objective:

To backup the DHCP database

**Pre-requisites:** Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

**Domain Controller / DHCP Server**

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

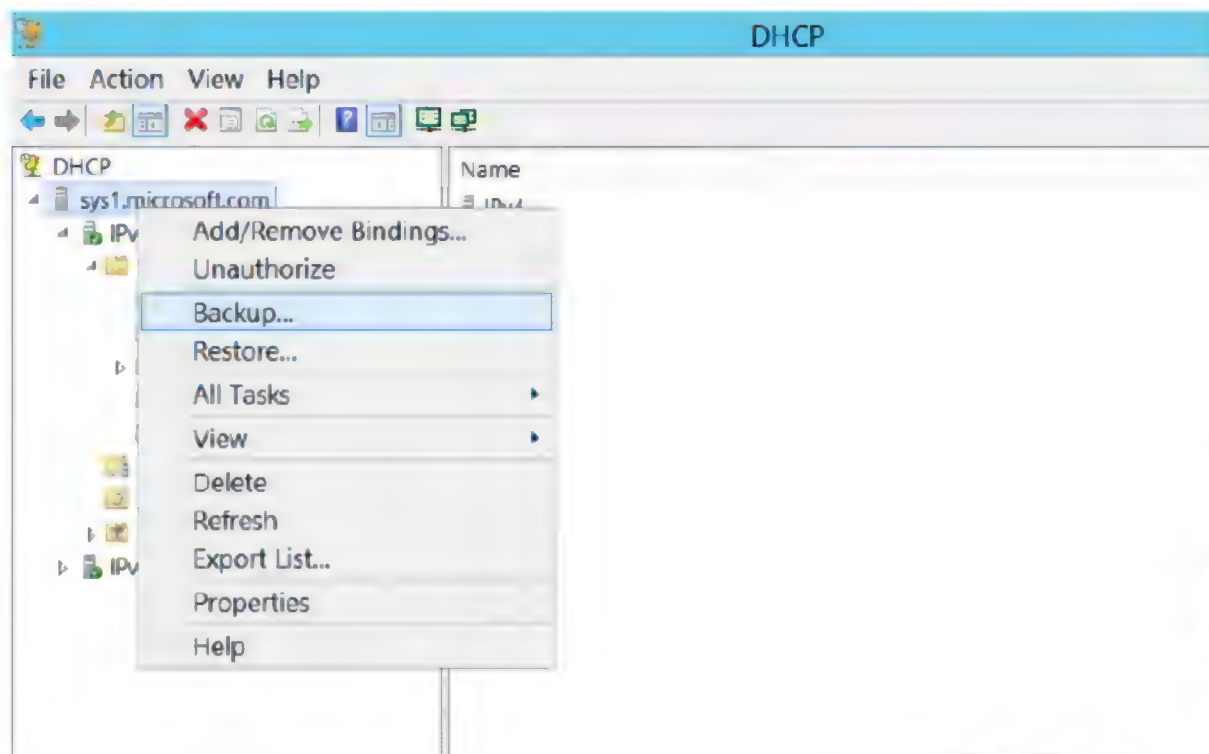
**Member Server / Client**

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

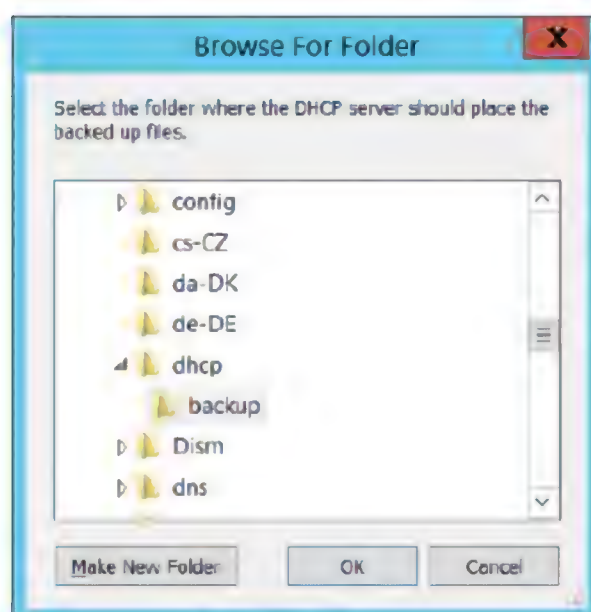


**Steps:**

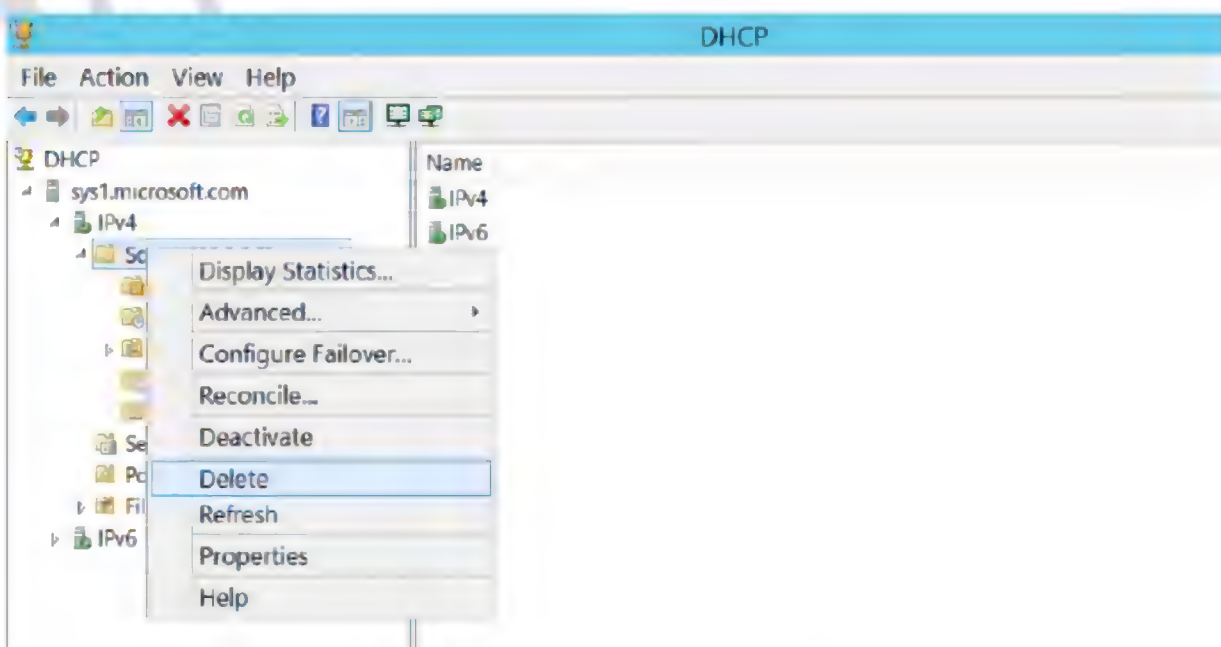
1. Go to DHCP console → right click the server name → select **Backup**



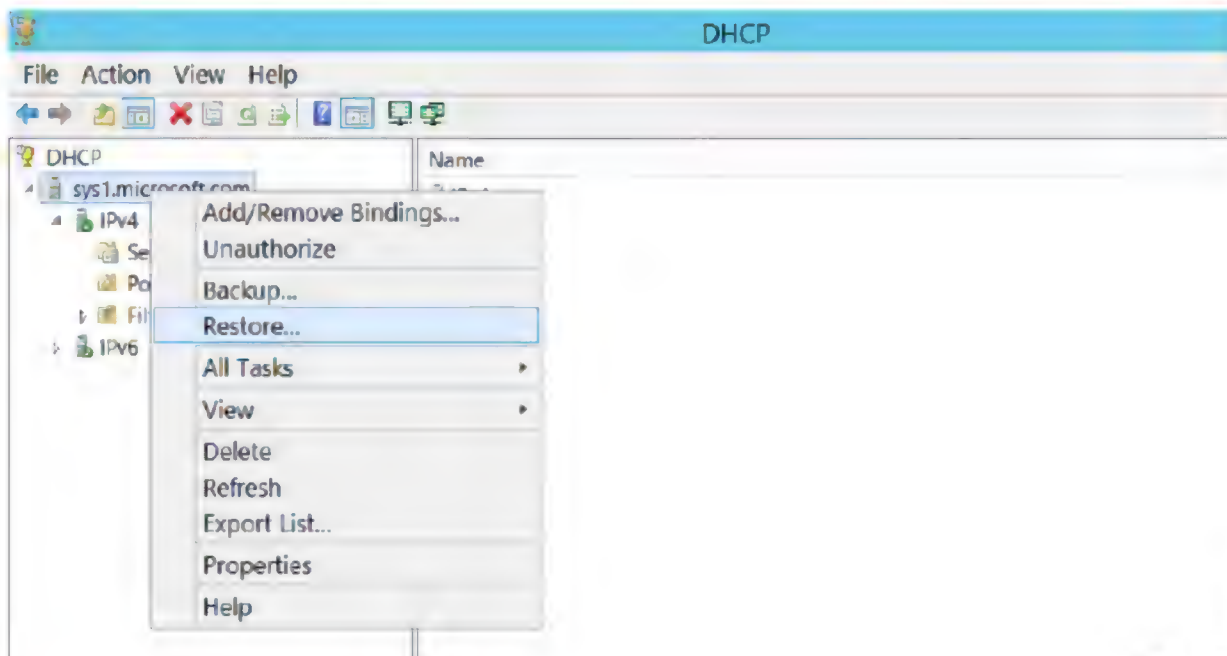
2. Select the Location to save the **backup file** → **OK**



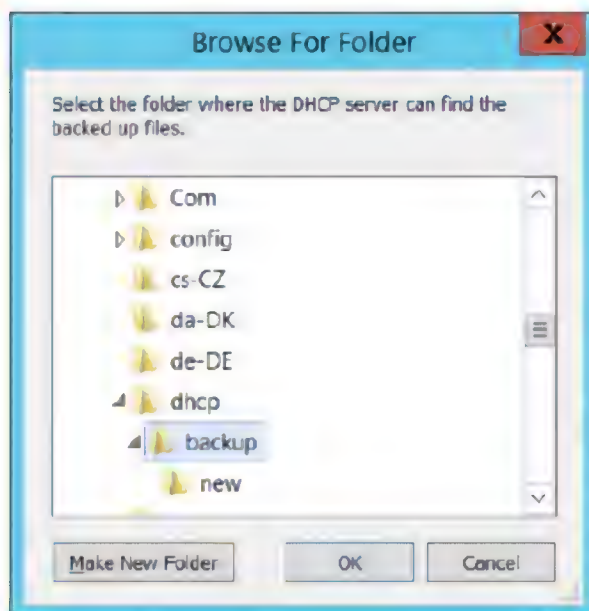
3. **Delete the Existing scope**



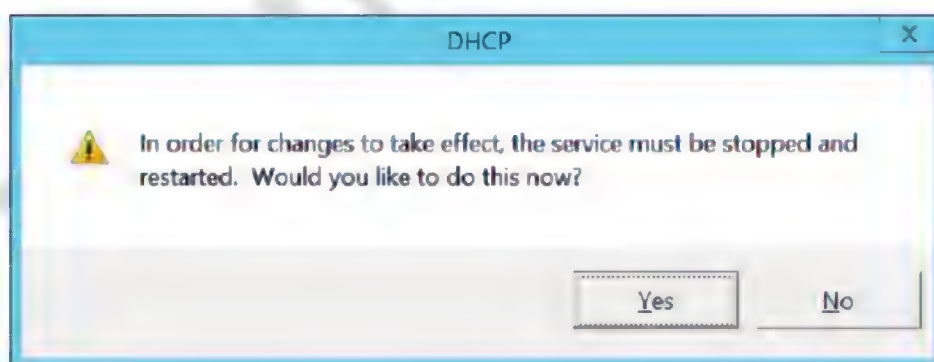
4. In DHCP Console → right click the server name → select **Restore**.



5. Select the location of file for **Restoration**.



6. Click **Yes**.



7. Click **OK** and for the Scope restored in DHCP Console.



## Lab – 49: Configuring DHCP Server Failover

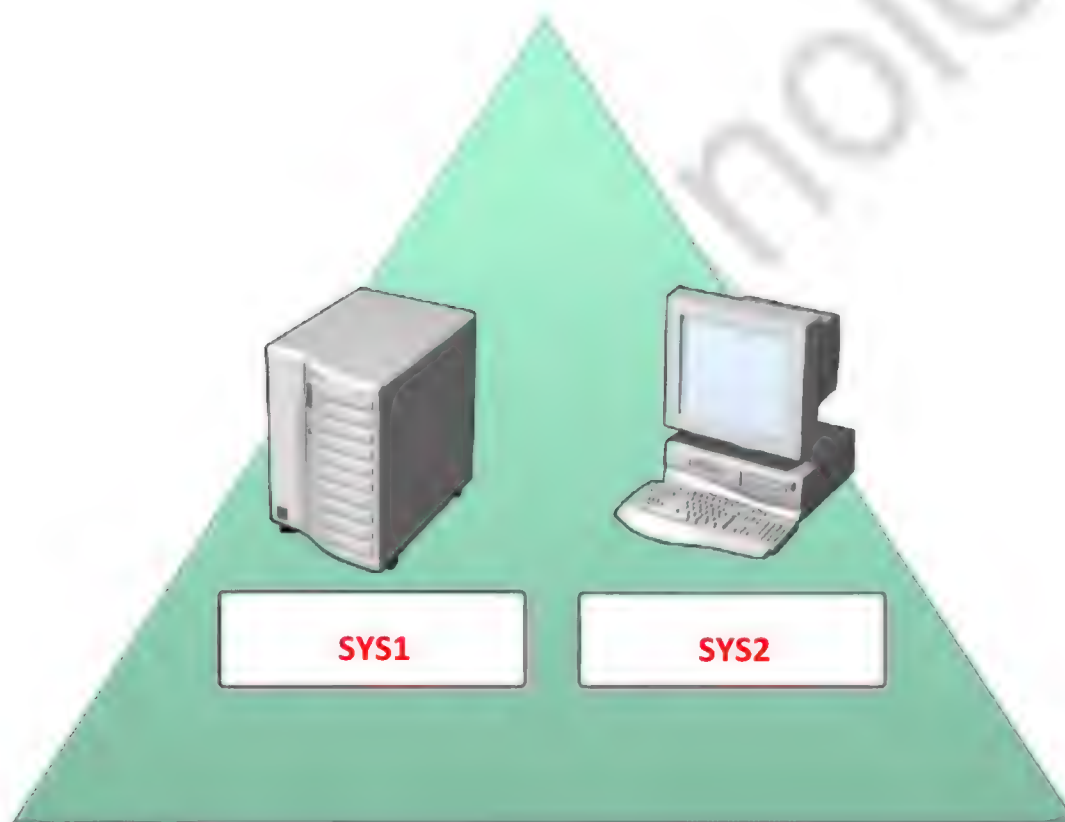
### Objective:

To configure high availability of DHCP servers using DHCP failover

**Pre-requisites:** Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A member server running windows 2012 server.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller / DHCP Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### Member Server / DHCP Server

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1



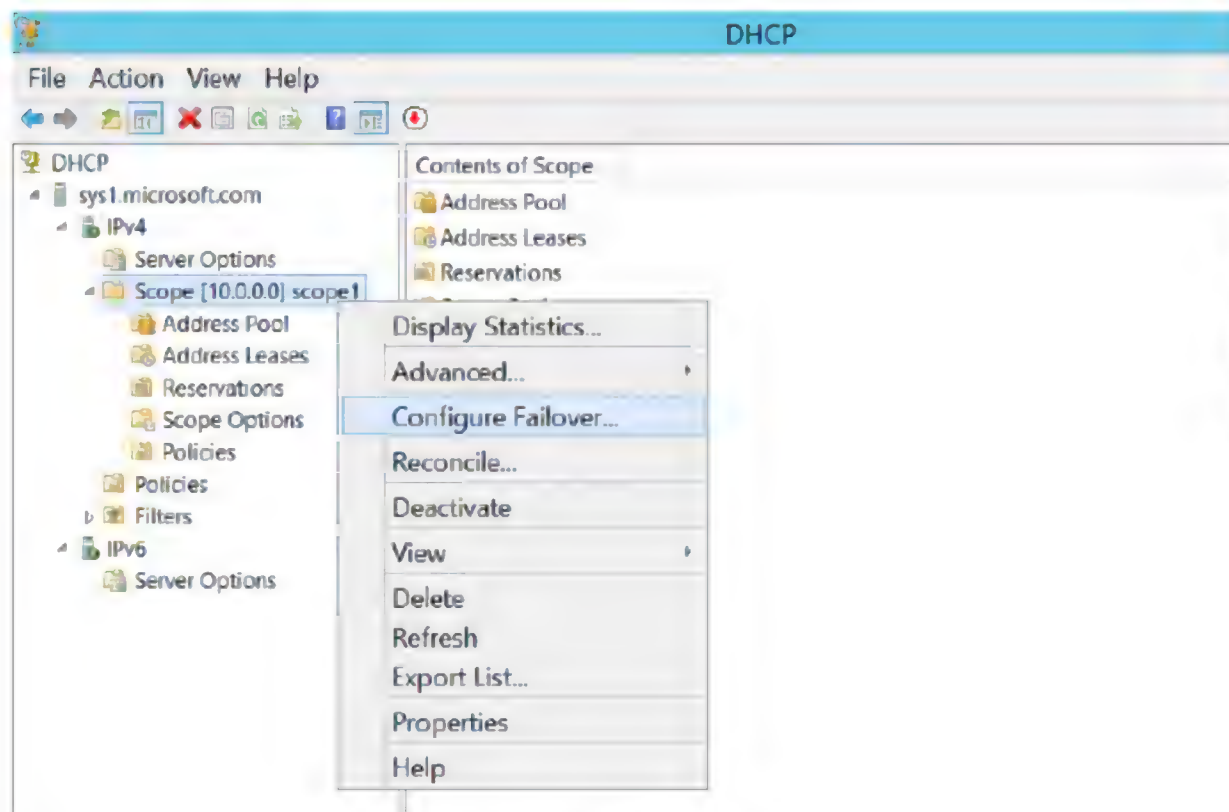


## SYS2 - CONFIGURATION

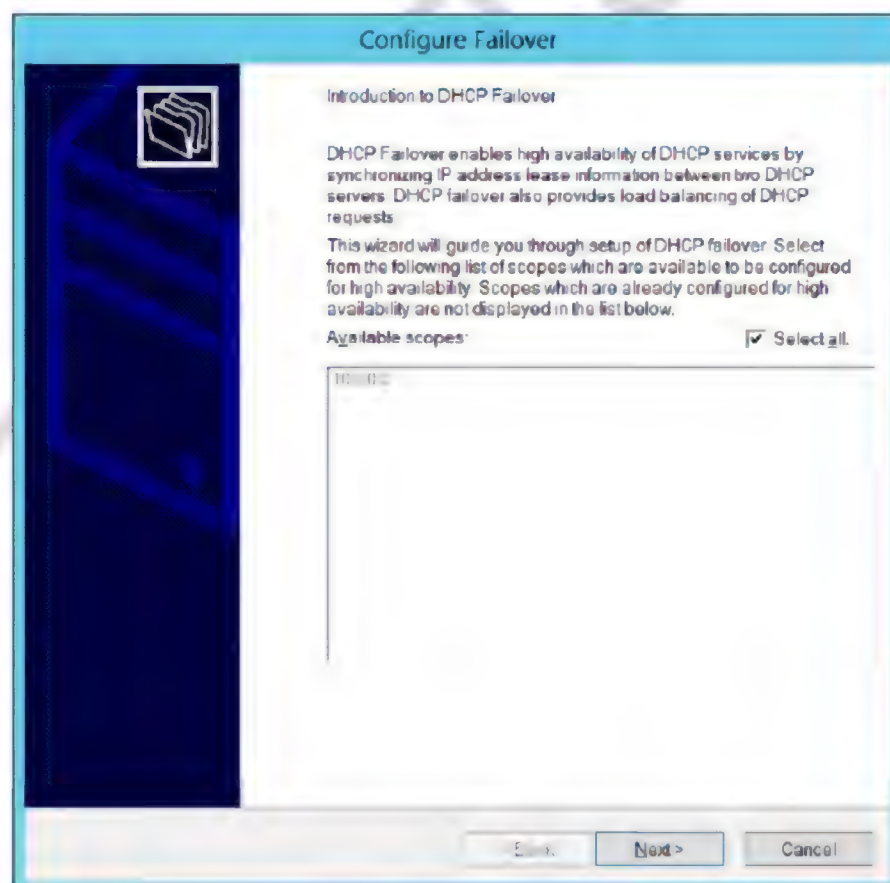
1. Install DHCP Server Role on SYS2 and Do not Authorize the Server.

## SYS1 - CONFIGURATION

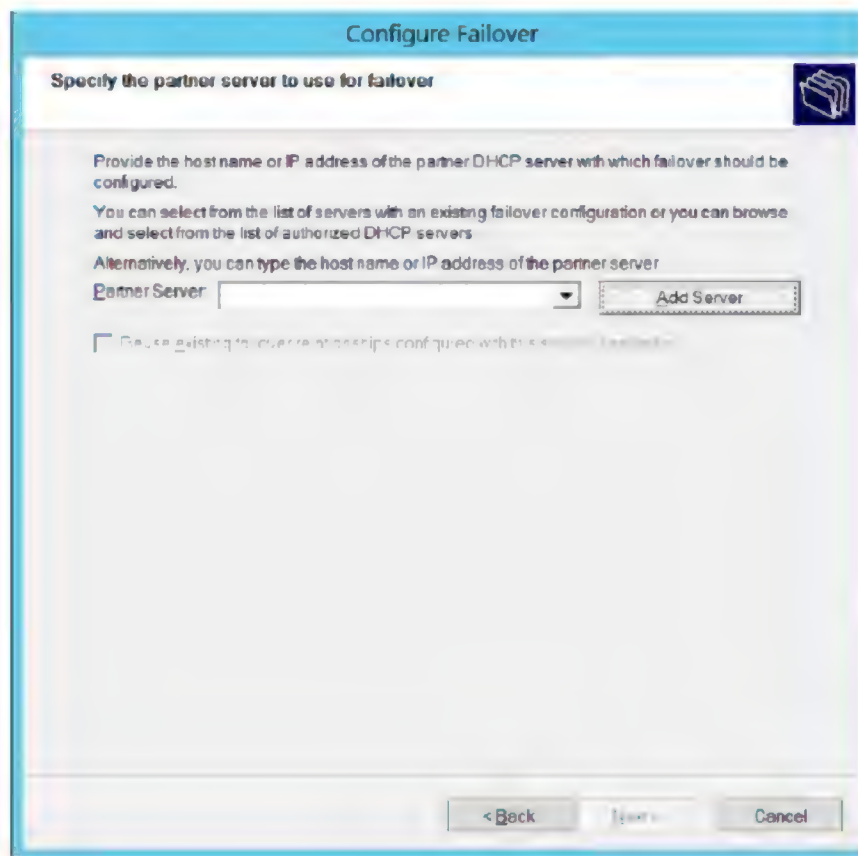
1. Go to DHCP console → In left pane, expand Server name → Expand IPv4 → right click Scope → select **Configure Failover**



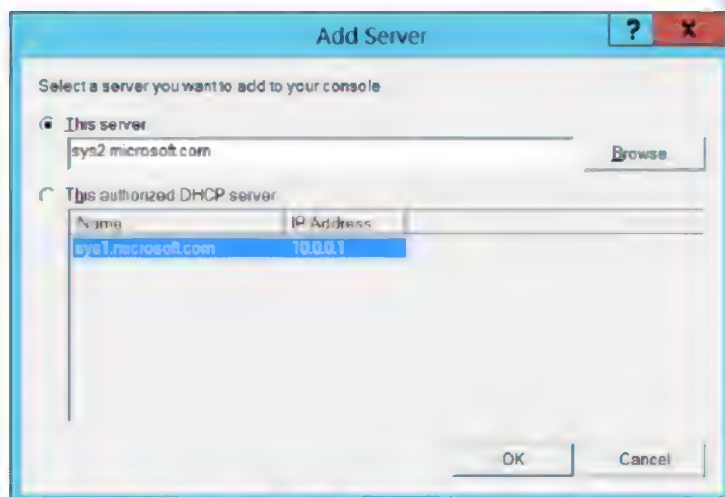
2. In Introduction to DHCP Failover wizard, click **Next**.



3. Click **Add Server** to add the Failover Server.



4. In Add Server, Browse and Select the server (**sys2.microsoft.com**), click **OK**.



5. Select the Mode, **Enable Message Authentication** and enter Shared Secret, **Next**.

**Configure Failover**

Create a new failover relationship

Create a new failover relationship with partner sys2.microsoft.com

Relationship Name: sys1.microsoft.com-sys2.microsoft.com

Maximum Client Lead Time: 1 hours 0 minutes

Mode: Load balance

Load Balance Percentage

Local Server	50 %
Partner Server	50 %

☐ State Switchover Interval: 0 minutes

☒ Enable Message Authentication

Shared Secret: [Empty]

< Back   Next >   Cancel

6. To Complete the Failover, click **Finish**.

**Configure Failover**

Failover will be set up between sys1.microsoft.com and sys2.microsoft.com with the following parameters:

Scopes: 0000

Relationship Name	sys1.microsoft.com-sys2.microsoft.com
Maximum Client Lead Time	1 hrs 0 mins
Mode	Load balance
State Switchover Interval	Disabled
Load Balance Percentage	
Local Server	50 %
Partner Server	50 %

< Back   Finish   Cancel

7. Verify the Summary to be **Successful**.

**Configure Failover**

Progress of failover configuration

The log below shows the progress of the various tasks for configuring failover including any errors encountered:

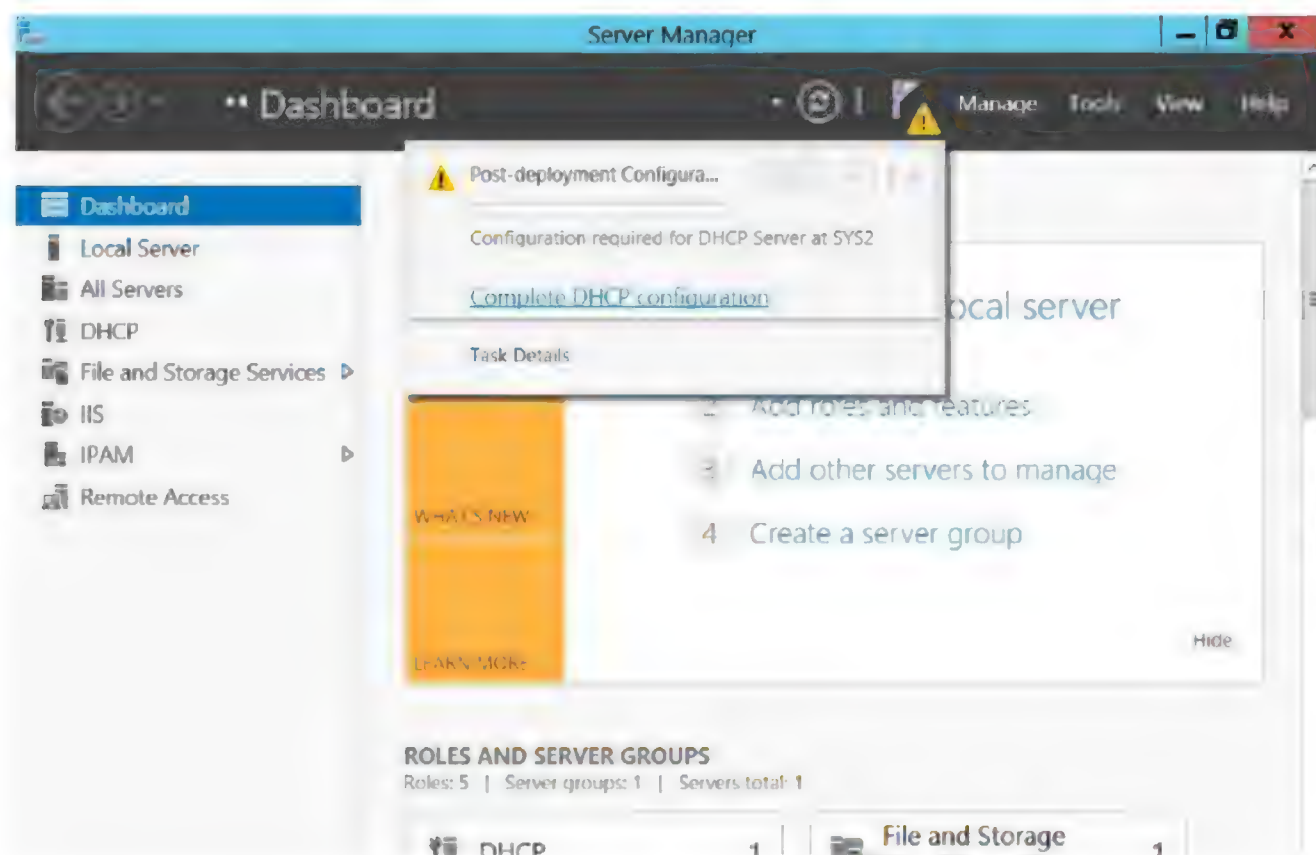
Add scopes on partner server	Successful
Disable scopes on partner server	Successful
Creation of failover configuration on partner server	Successful
Creation of failover configuration on host server	Successful
Activate scopes on partner server	Successful
Configure failover successful	

Close

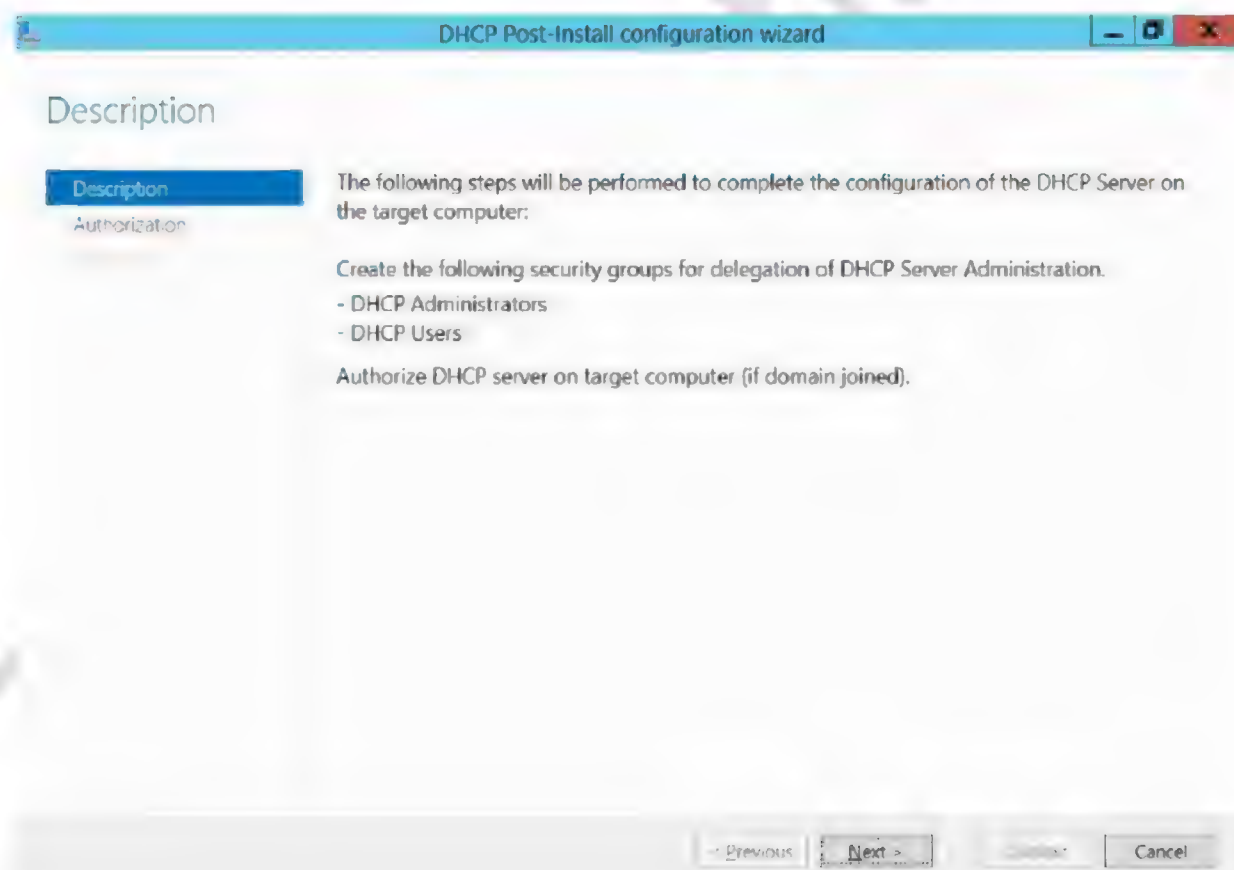


## SYS2 - CONFIGURATION

1. Go to Server Manager Dashboard, select notification flag, **Complete DHCP Configuration**.



2. In DHCP Post-Install configuration wizard, click **Next**.



- Click **Commit**, to Authorize the DHCP server **sys2.microsoft.com**

The screenshot shows the 'Authorization' step of the 'DHCP Post-Install configuration wizard'. The window title is 'DHCP Post-Install configuration wizard'. On the left, there is a sidebar with 'Description' and 'Authorization' (selected). The main area contains the following text: 'Specify the credentials to be used to authorize this DHCP server in AD DS.' Below this, there are three radio button options:
 

- ☒ Use the following user's credentials: User Name: Microsoft\Administrator
- ☐ Use alternate credentials: UserName: Specify...
- ☐ Skip AD authorization

 At the bottom right, there are four buttons: '< Previous', 'Next >', 'Commit', and 'Cancel'.

- Verify the summary and click **Close**.

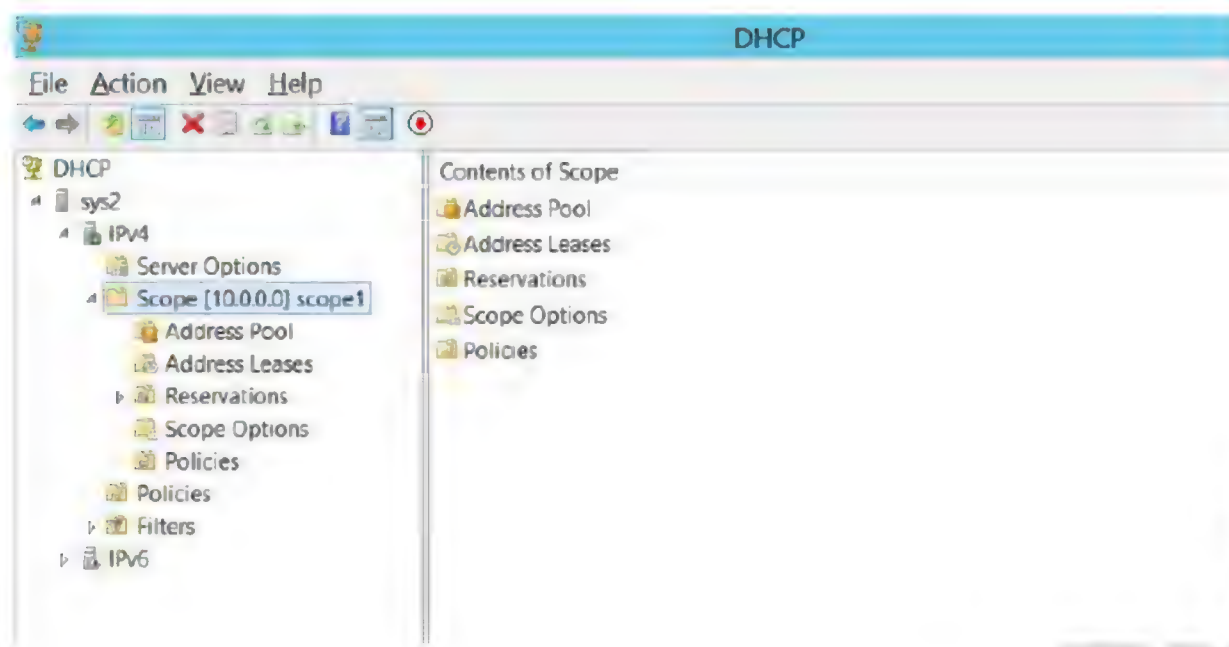
The screenshot shows the 'Summary' step of the 'DHCP Post-Install configuration wizard'. The window title is 'DHCP Post-Install configuration wizard'. On the left, there is a sidebar with 'Summary' (selected). The main area contains the following text: 'The status of the post install configuration steps are indicated below.' Below this, there is a box with the following content:
 

- Creating security groups ..... Done
- Please restart the DHCP server service on the target computer for the security groups to be effective.
- Authorizing DHCP server ..... Done

 At the bottom right, there are four buttons: '< Previous', 'Next >', 'Close', and 'Cancel'.

**Verification:**

1. Go to DHCP console and verify the scope replicated from sys1





## Lab – 50: Installing and Configuring Domain Naming System (DNS)

### Objective:

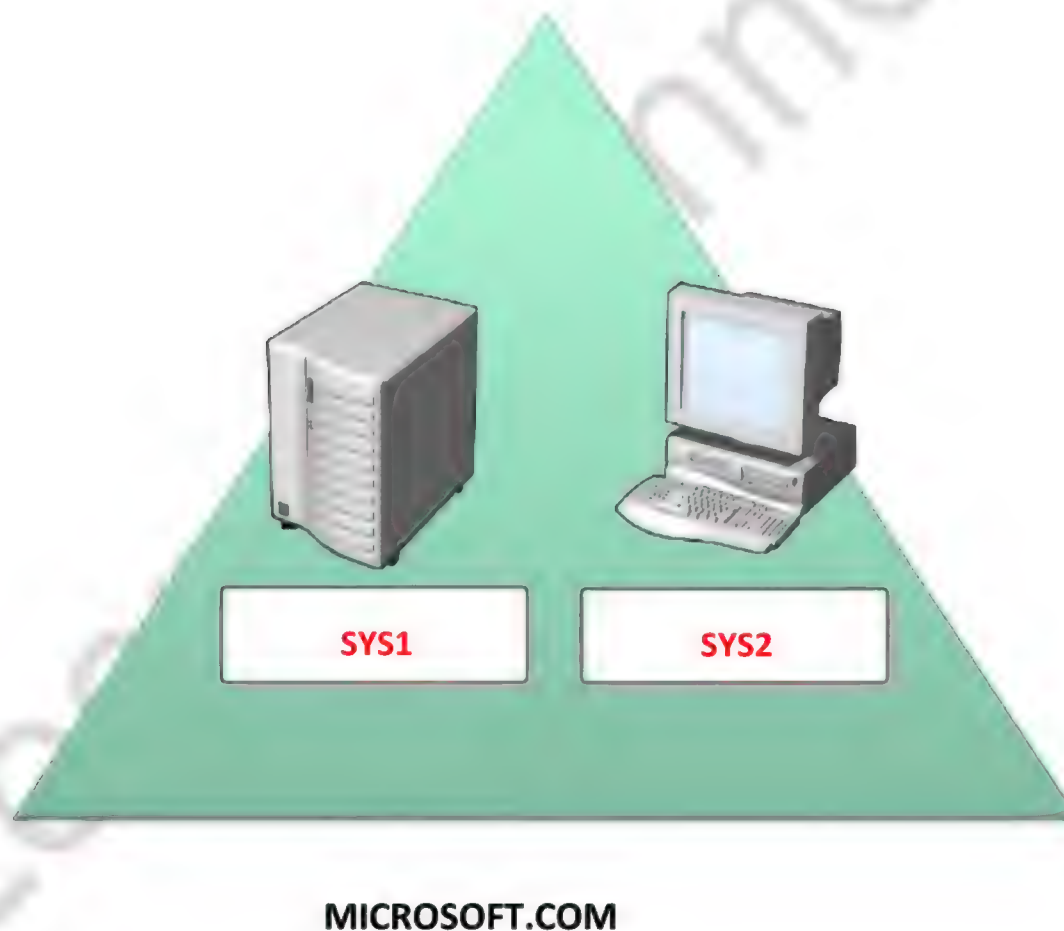
To configure DNS for name resolution

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



#### SYS1

##### Domain Controller / DNS Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### Member Server / DNS Server

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.2

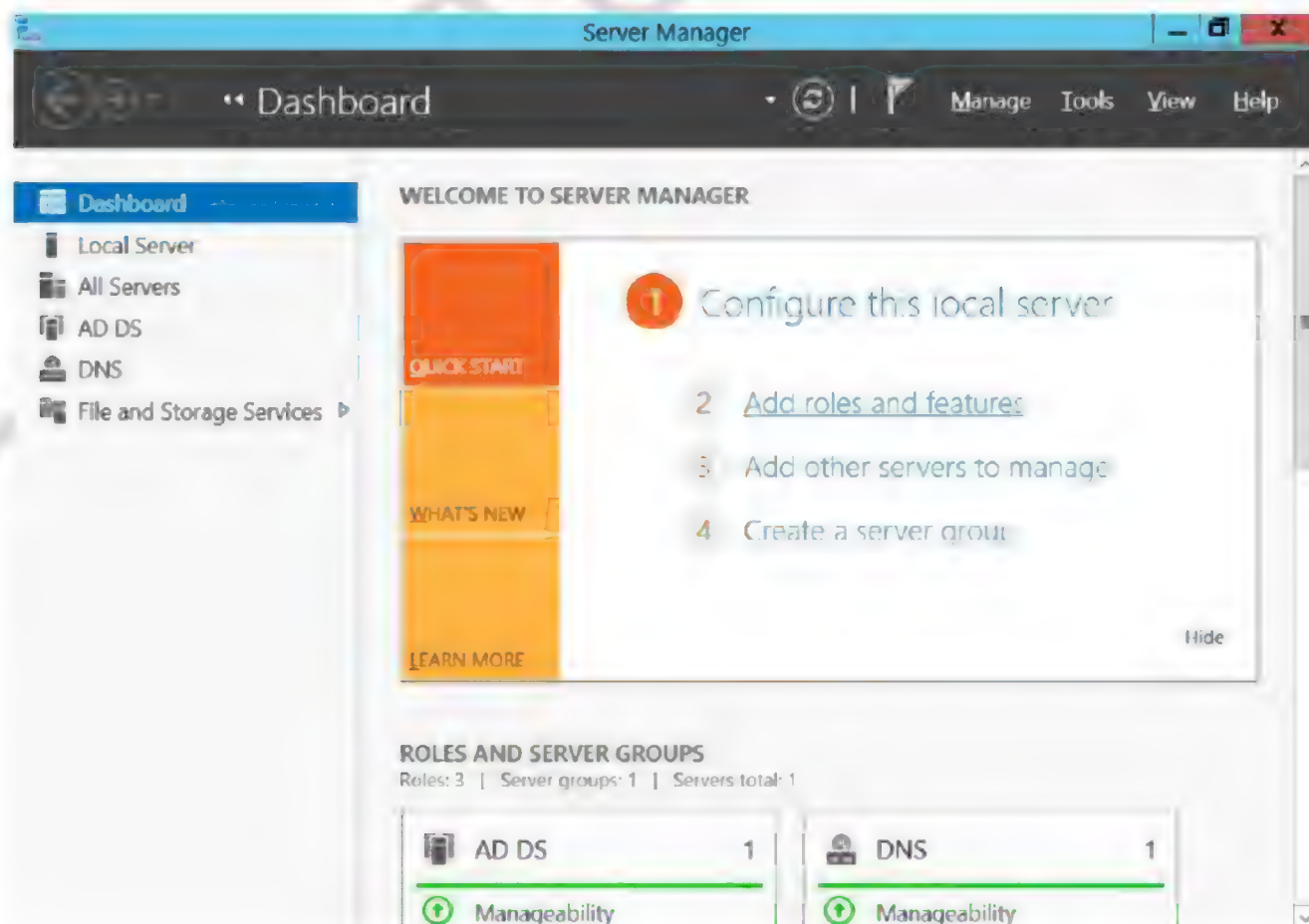
## Installing DNS Service

### SYS1 -CONFIGURATION

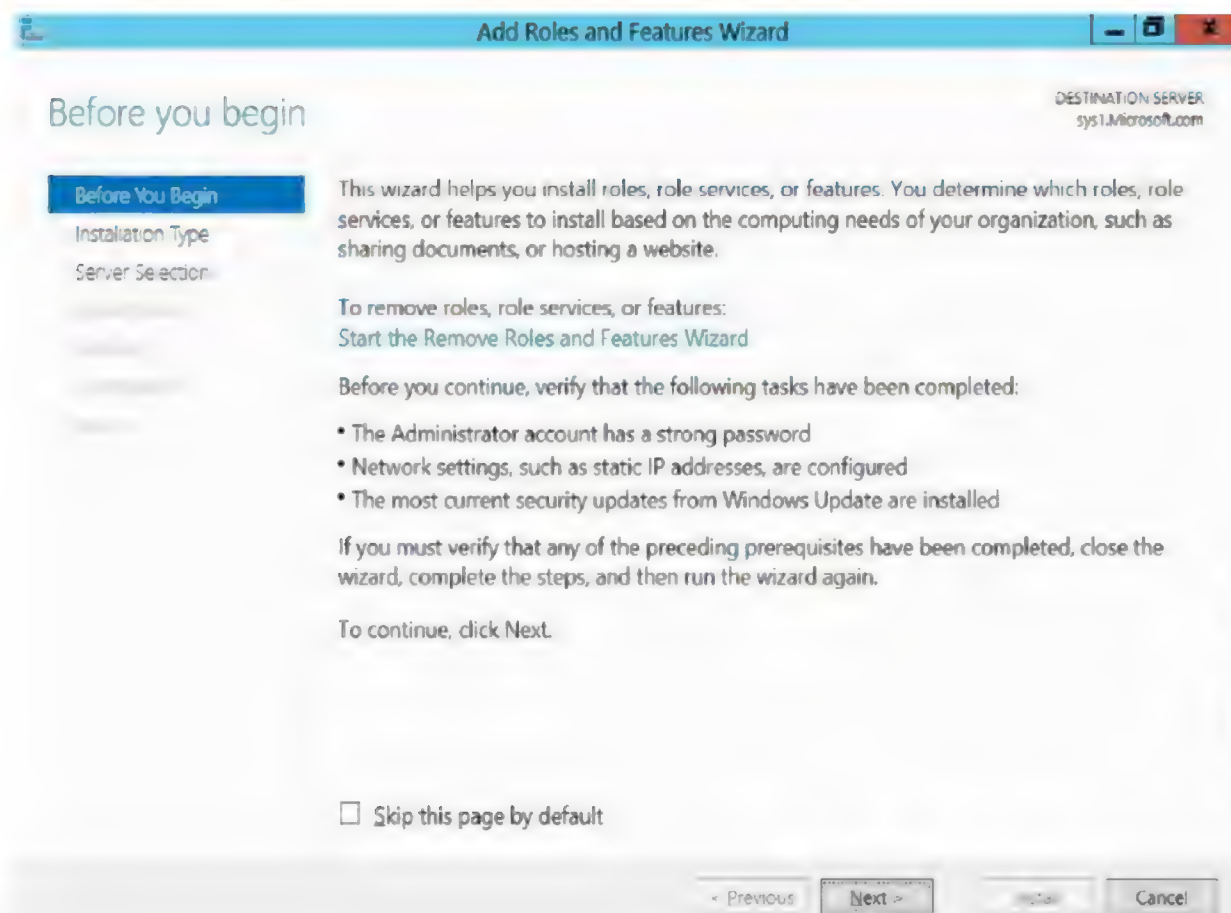
1. Select Click **Server Manager**.



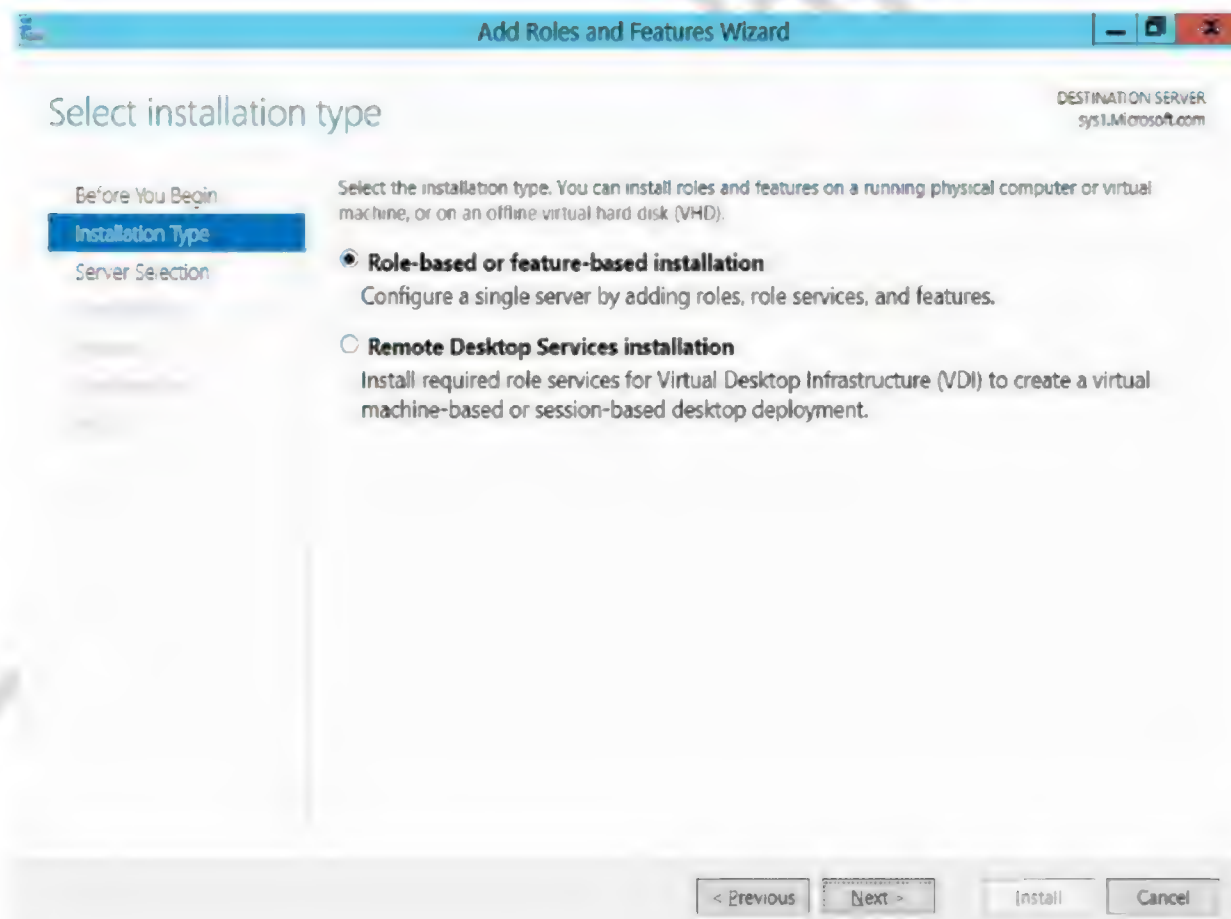
2. In the Server Manager Console, Select **Add roles and features**



3. In Before you begin page, click **Next**.

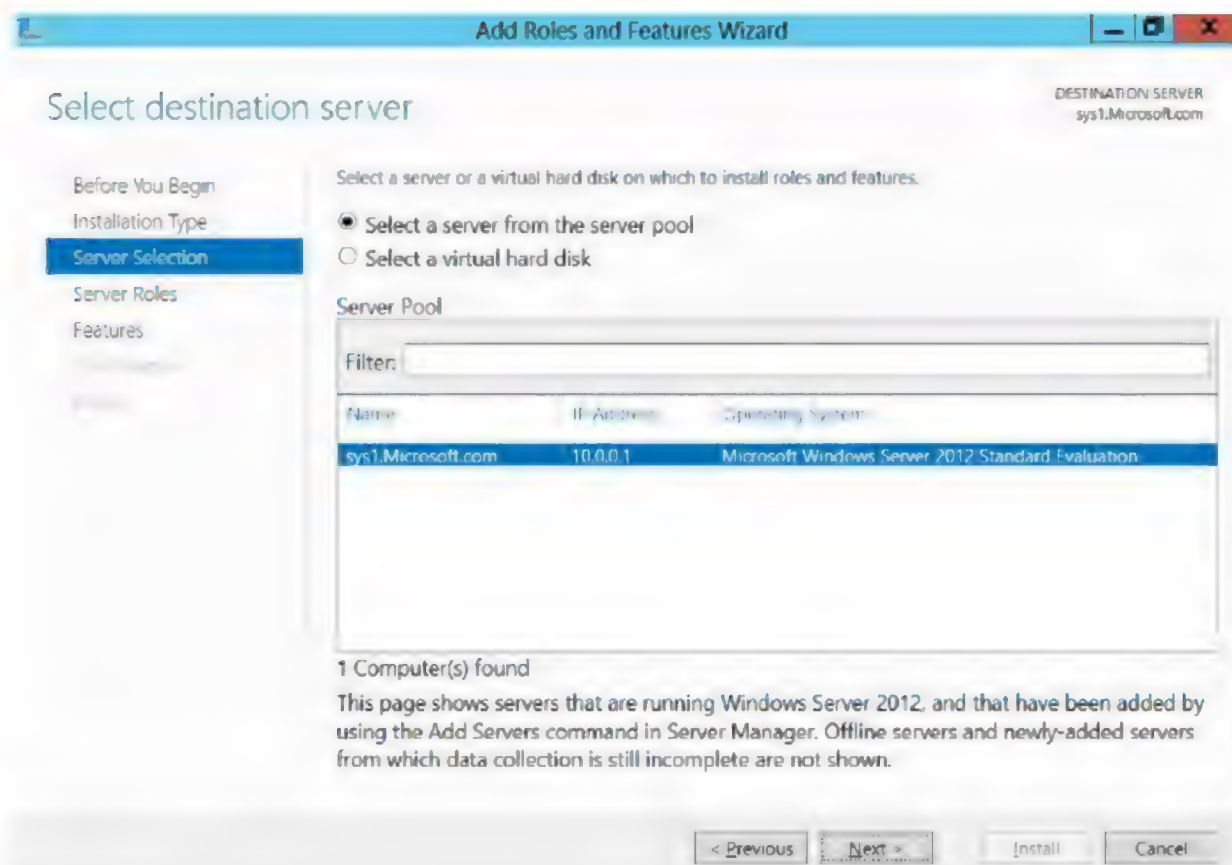


4. Select Role-based or feature-based installation and click **Next**.

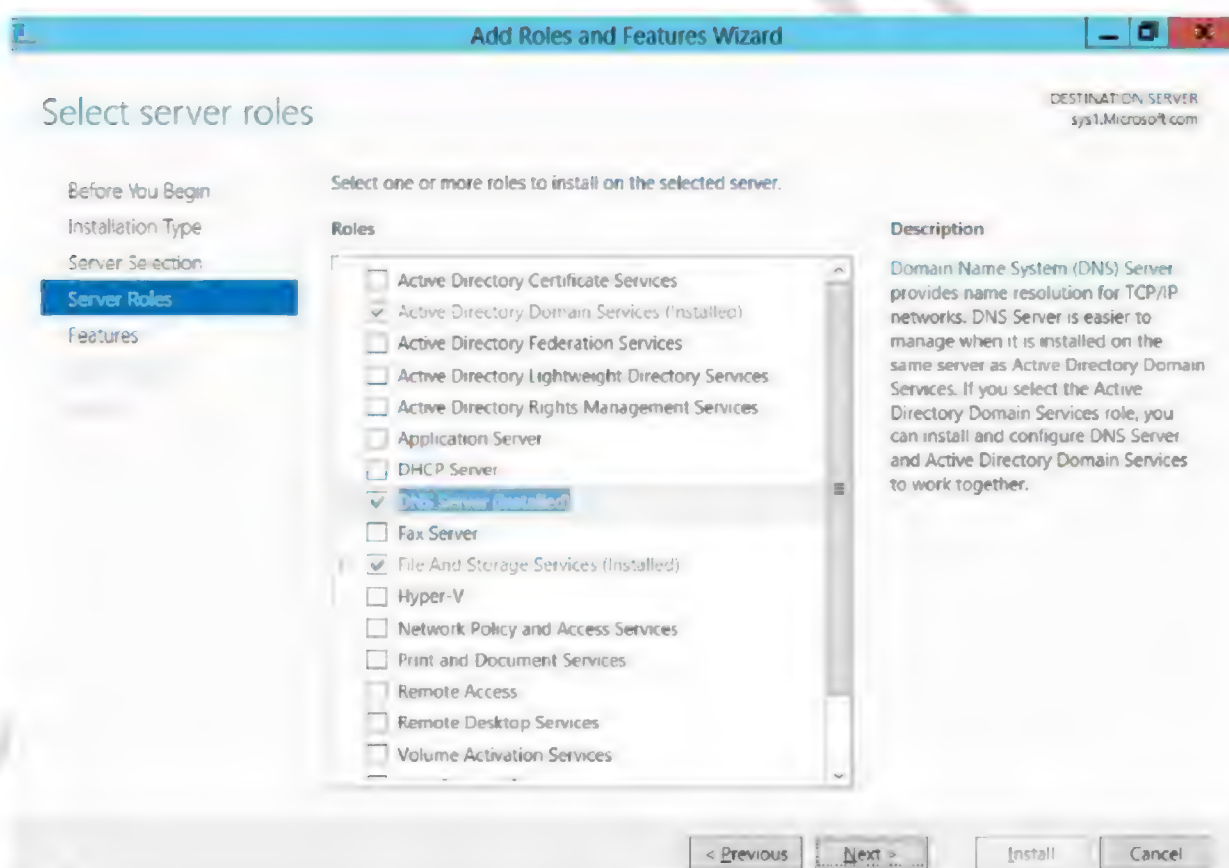




5. Select a server (**sys1.Microsoft.com**) from the server pool and click **Next**.



6. Check box **DNS Server**, click **Next** → **Next** → **Install** → **Finish**.

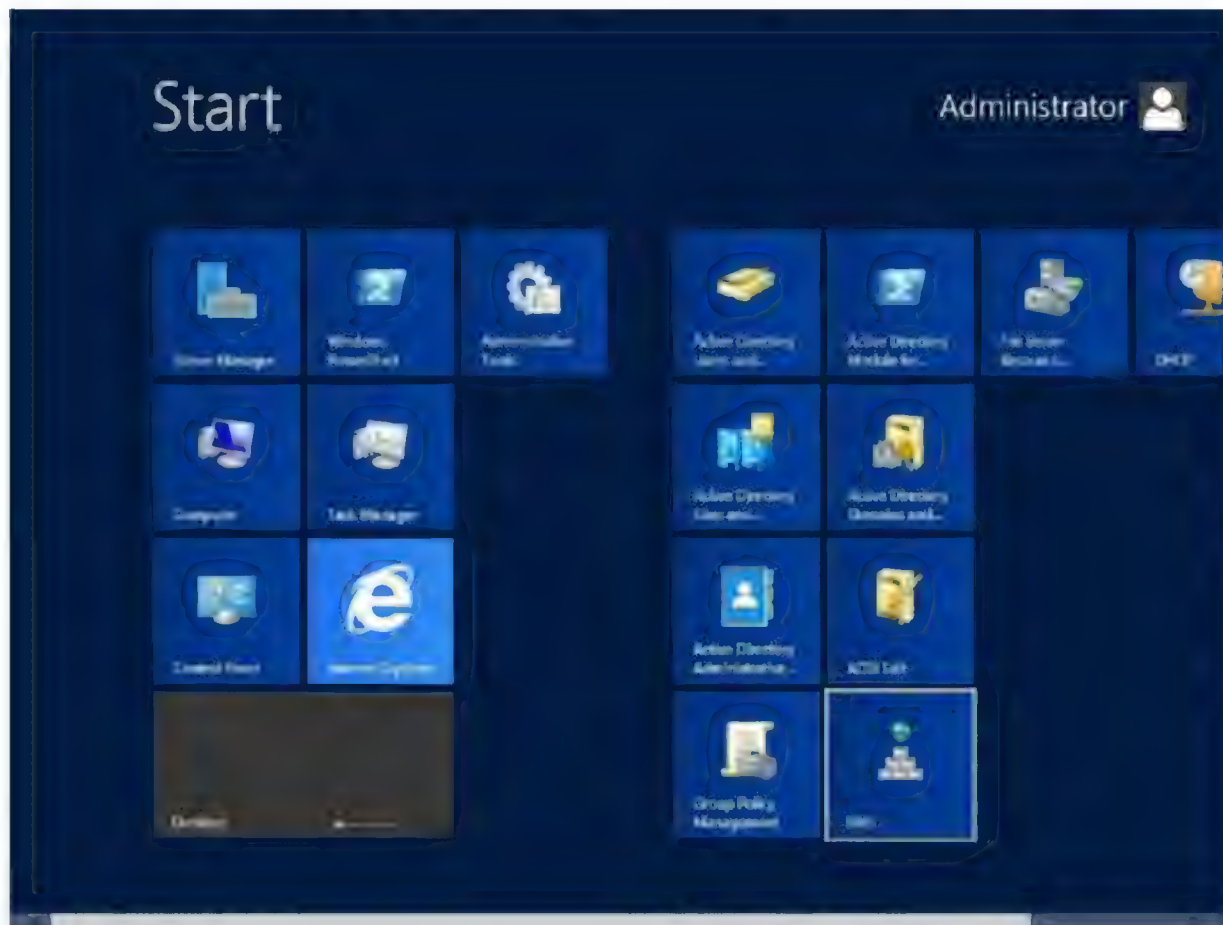


**Note:** On **Domain Controller**, by default DNS Server Role will be installed.

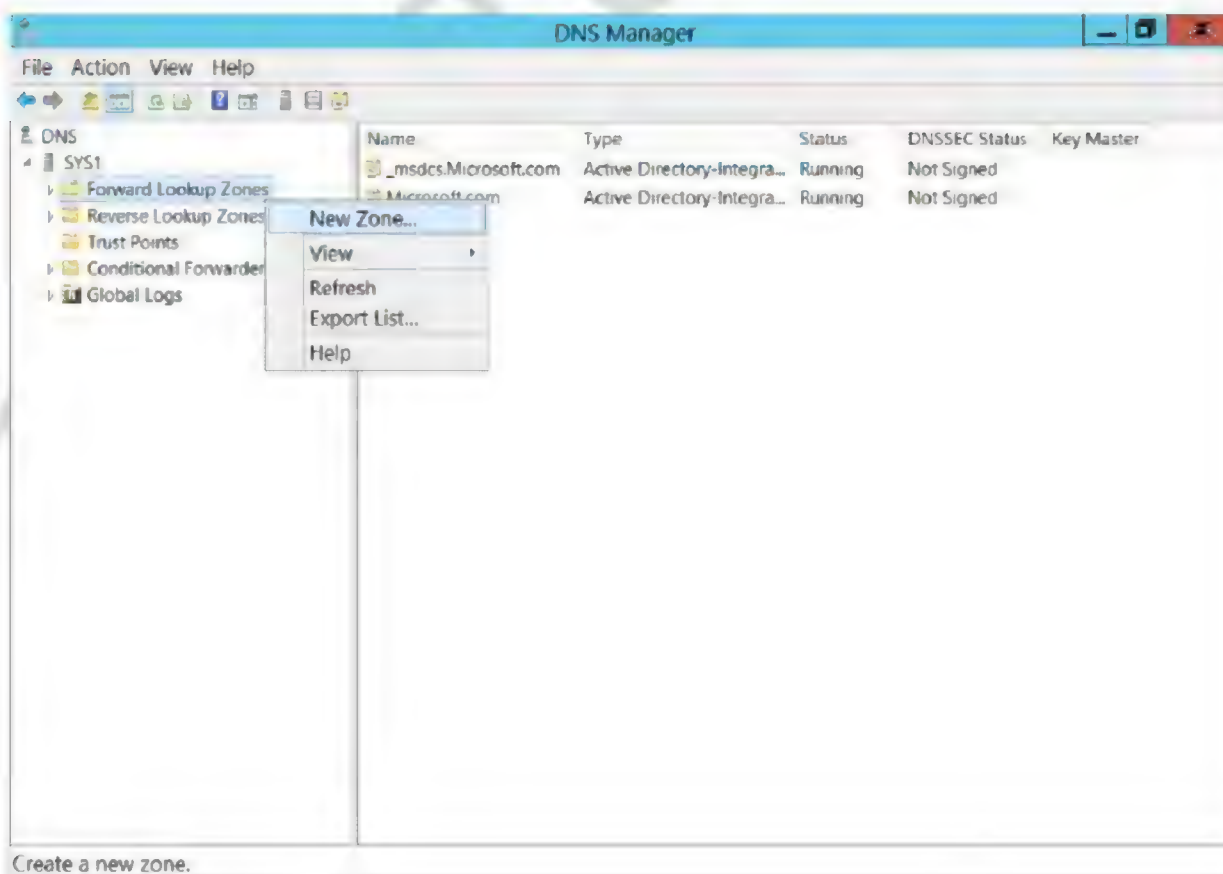
On **Member Server** we have to install the DNS Server Role Manually using the same process.

## Creating Standard Primary - Forward Lookup Zone

1. Go to Start, select **DNS**.



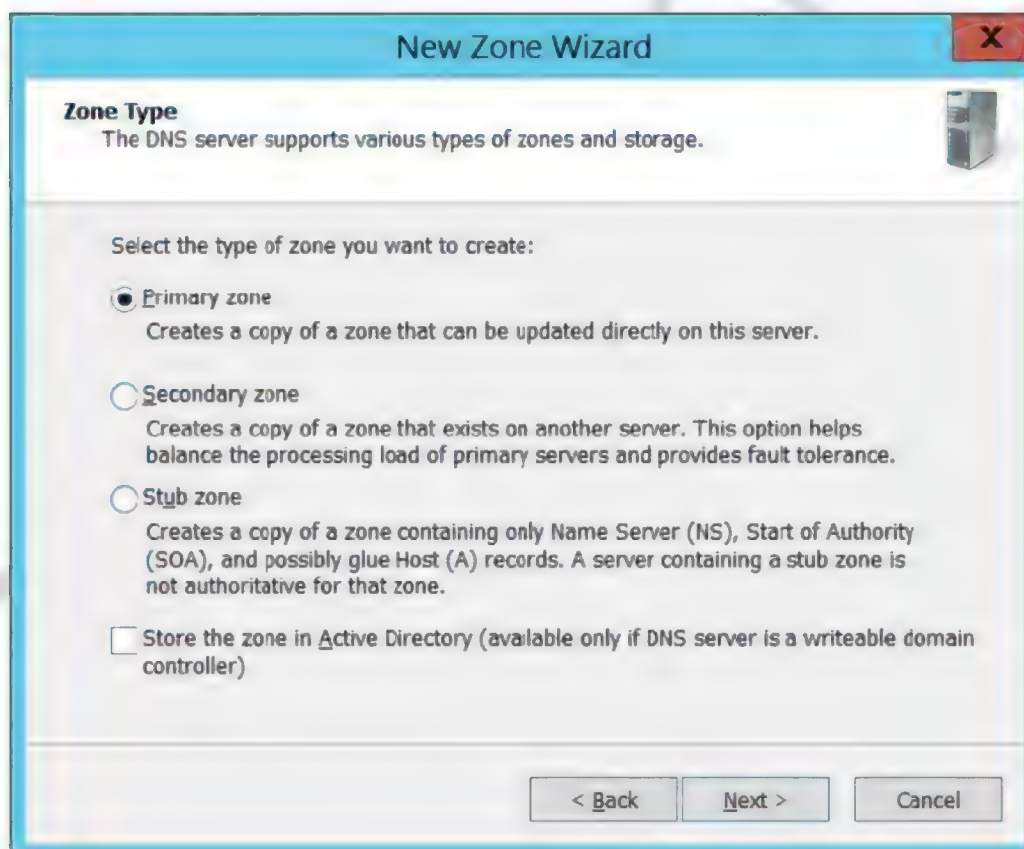
2. In the DNS dialog box, Expand the **DNS** → **Server name** in the left pane, right click the **Forward Lookup Zones** → select **New Zone**



3. In the welcome to new zone wizard click **Next**



4. Select **"Primary Zone"** and Remove the check box for **"Store the zone in Active Directory"**, click **Next**.





5. In the Zone Name screen, type in the name of the zone you are creating. This name is usually the FQDN of the DNS domain that the zone will contain, such as **YAHOO.COM** → click **Next**.



**New Zone Wizard**

**Zone Name**  
What is the name of the new zone?

The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:  
Yahoo.com

< Back   Next >   Cancel

6. The Zone File screen appears. In this screen, you can either create a new zone file for the new zone, or configure the new zone to use an existing file. Click **Next**.



**New Zone Wizard**

**Zone File**  
You can create a new zone file or use a file copied from another DNS server.

Do you want to create a new zone file or use an existing file that you have copied from another DNS server?

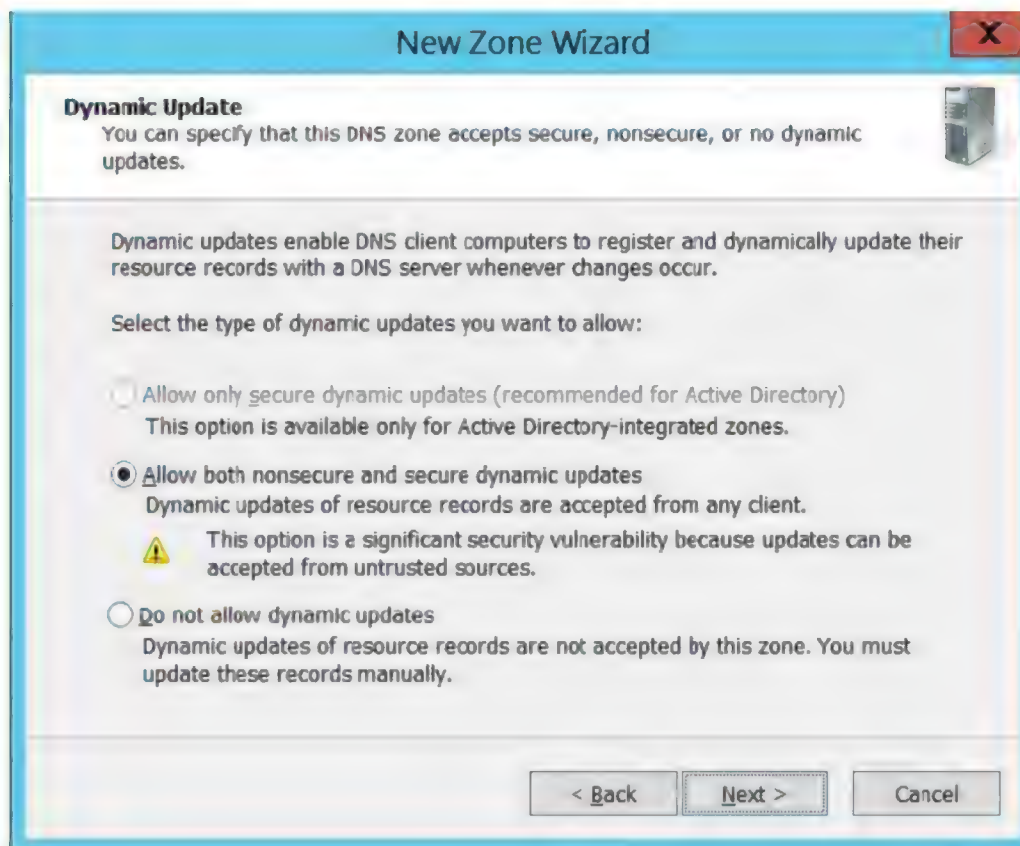
☒ Create a new file with this file name:  
Yahoo.com.dns

☐ Use this existing file:  
[Empty text box]

To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.

< Back   Next >   Cancel

7. In dynamic Update Select "**Allow both non-secure and secure dynamic update**"→click **Next**.



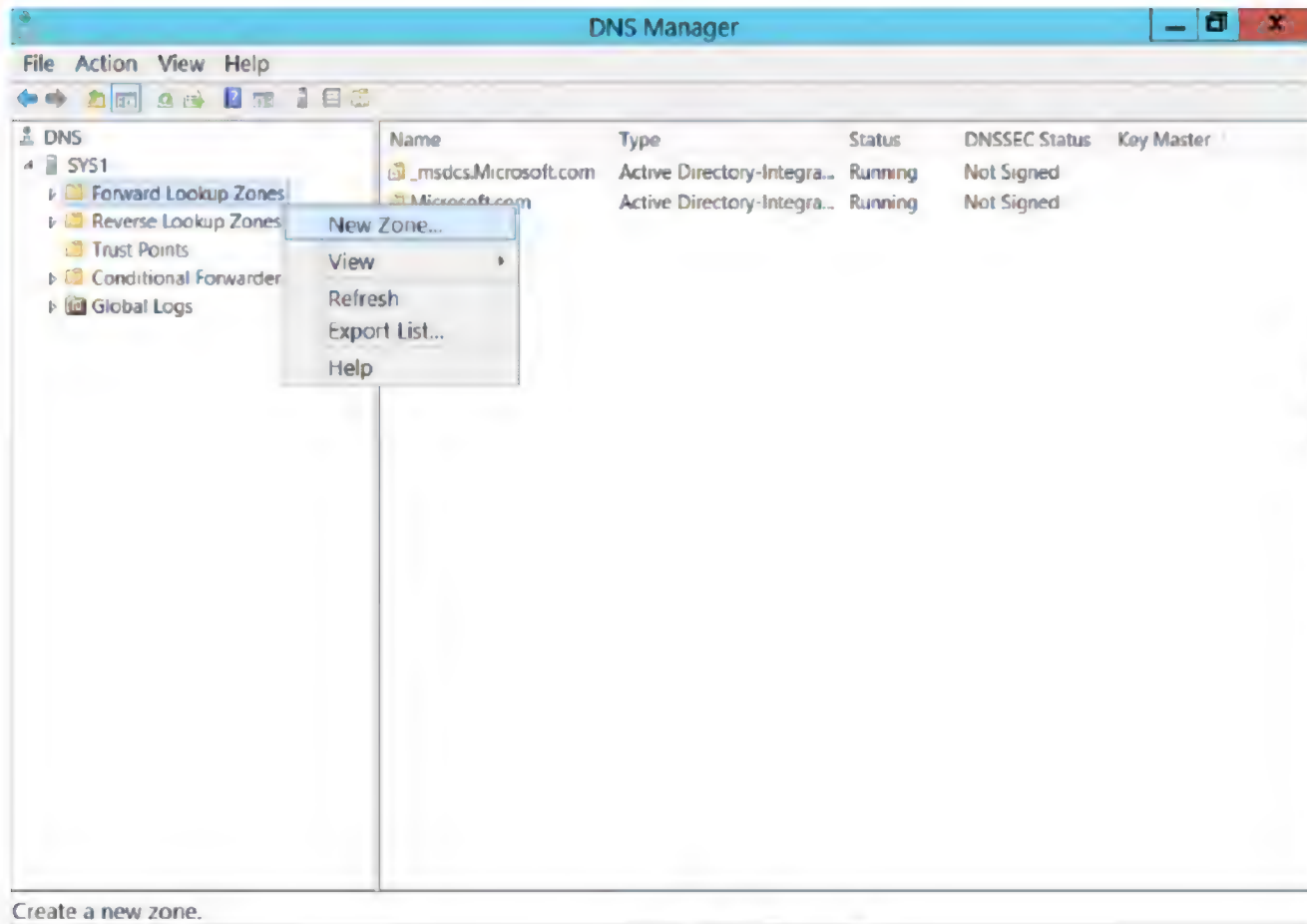
8. The Completing the New Zone Wizard screen appears. Click **Finish**.



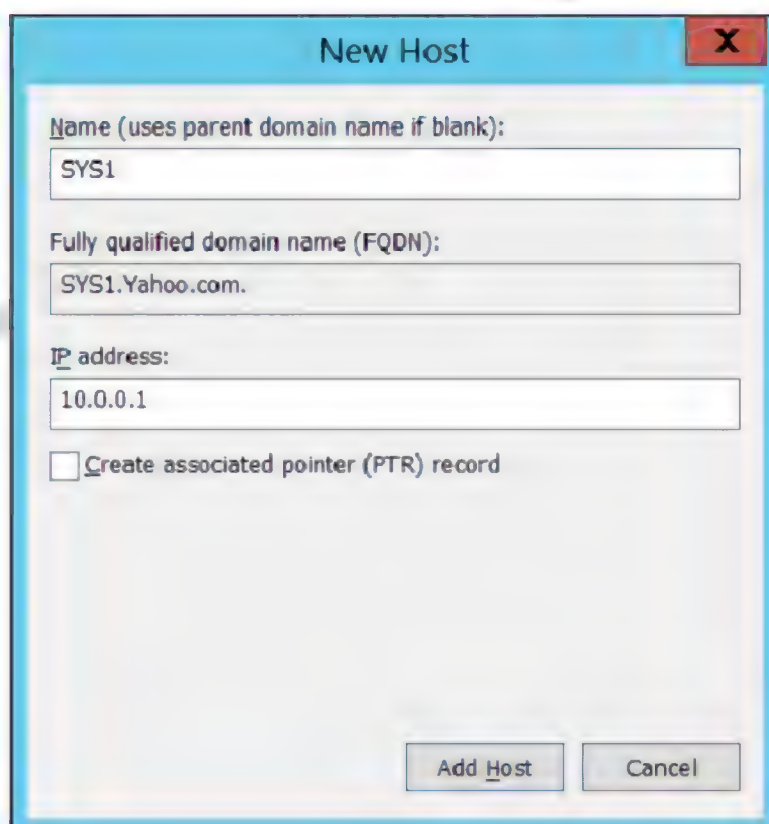
9. In the DNS Console, the new zone you created appears in the right pane.

## Creating Host Records for the standard primary zone

1. Go to Start, select **DNS**.
2. Right click the zone and select **New Host**.



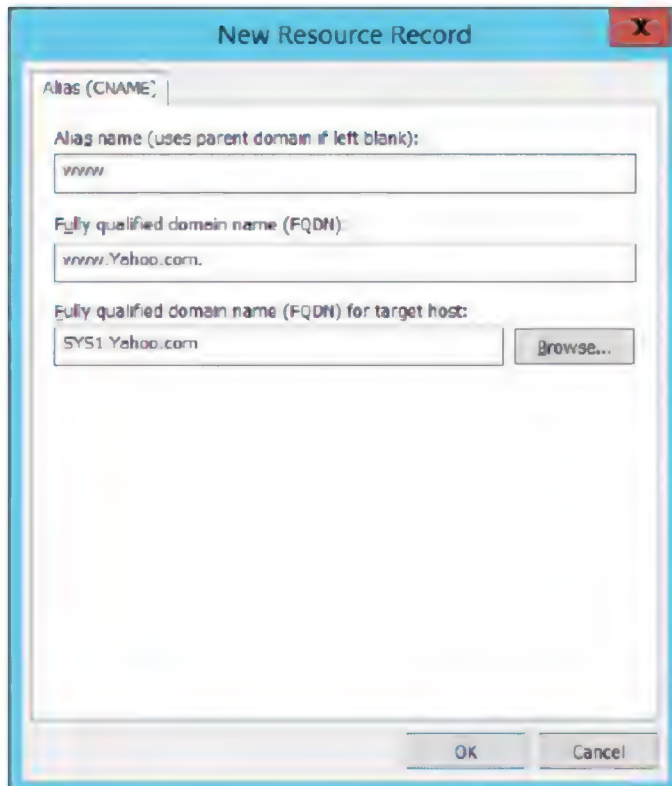
3. Enter the **Host name** for which you are configuring the record Ex: **SYS1**, enter the **corresponding IP address of the host** → click **Add Host** → **OK** → **Done**.





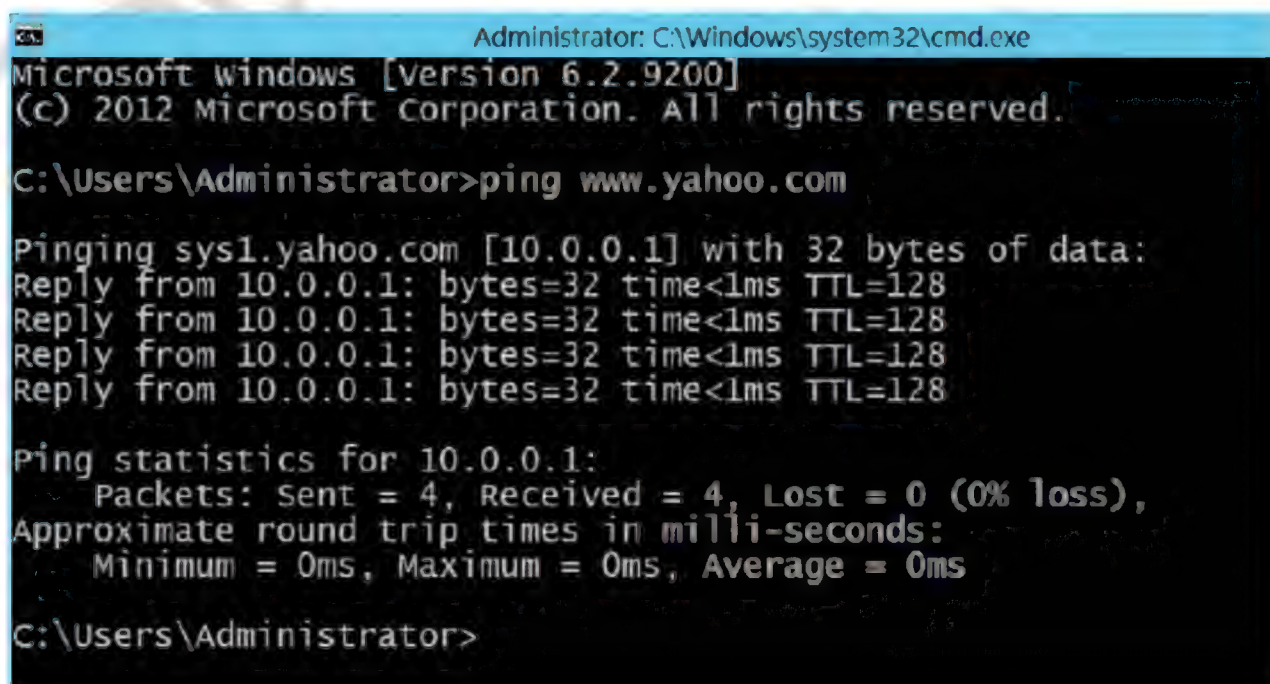
## Creating an Alias record for the host record

1. Go to Start, select **DNS**.
2. Right click the zone and select **New Alias**.
3. Enter the name in the '**Alias Name**' dialog box Ex: www
4. Click Browse → Double click system name → double click Forward Lookup Zone → double click the zone name → select the host name → click **OK**→**OK**



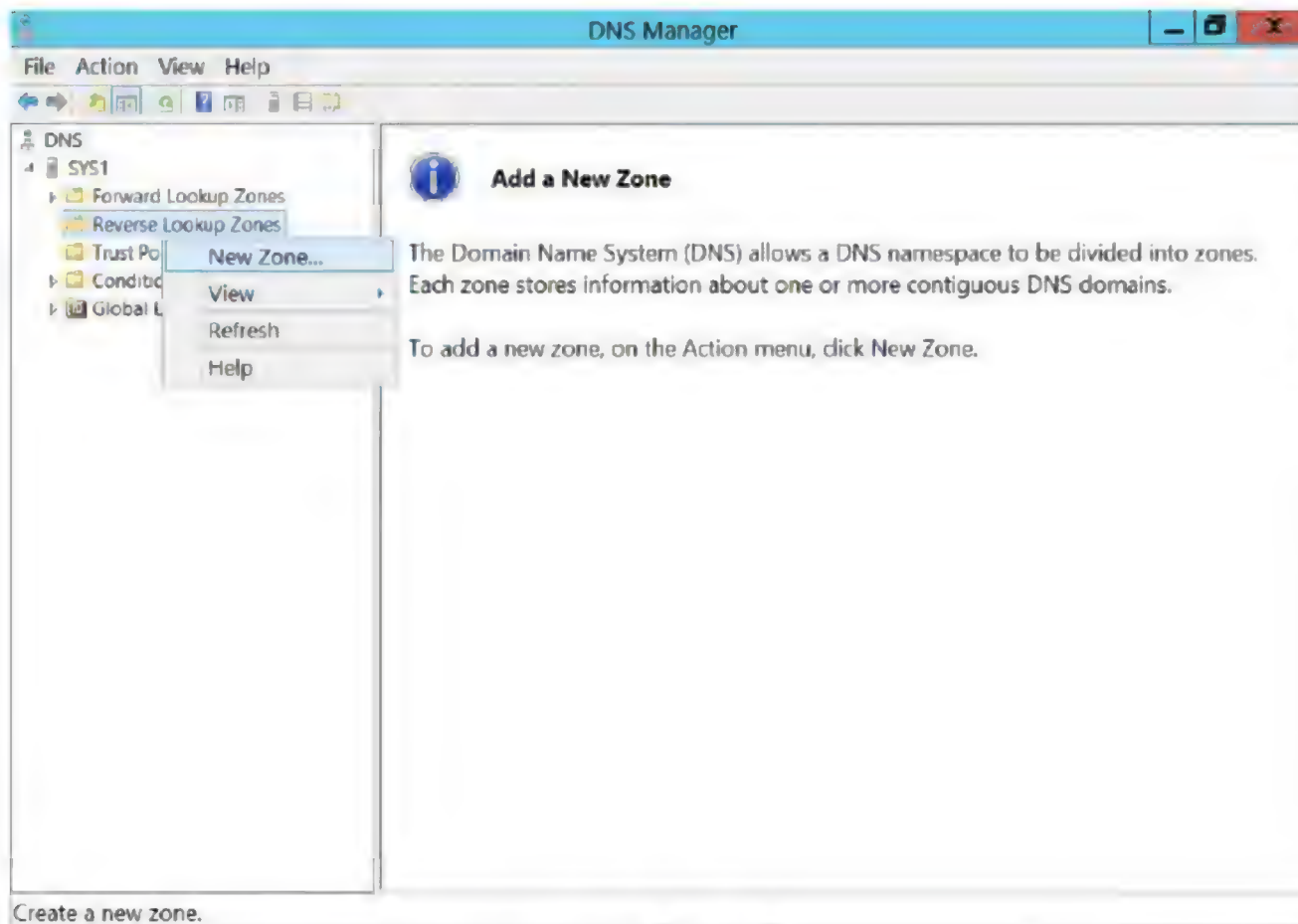
### Verification:

1. Open **Command Prompt** → type **ping FQDN** (Fully Qualified Domain Name)  
Ex: Ping SYS1.YAHOO.COM (or) Ping WWW.YAHOO.COM
2. Name should be resolved into IP Address.



## Creating Standard Primary - Reverse Lookup Zone

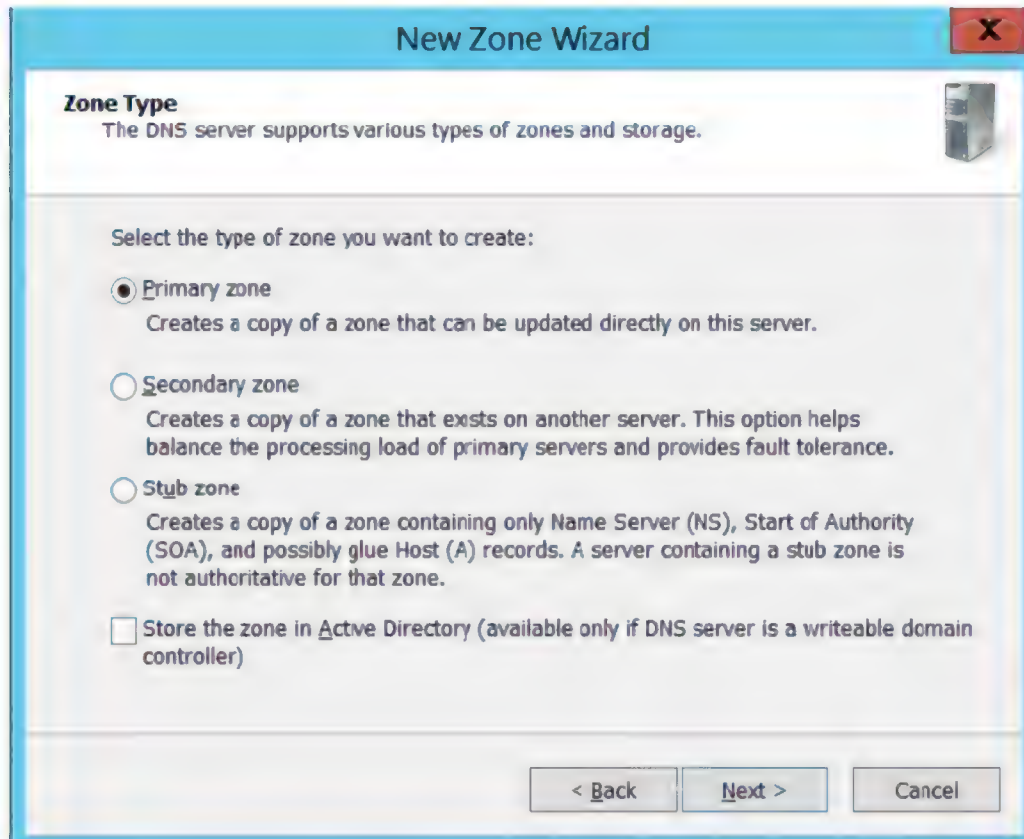
1. Go to Start, select **DNS**.
2. In the DNS dialog box, expand the **DNS server's name** in the left pane → right click the **Reverse Lookup Zones** → Select **New Zone**.



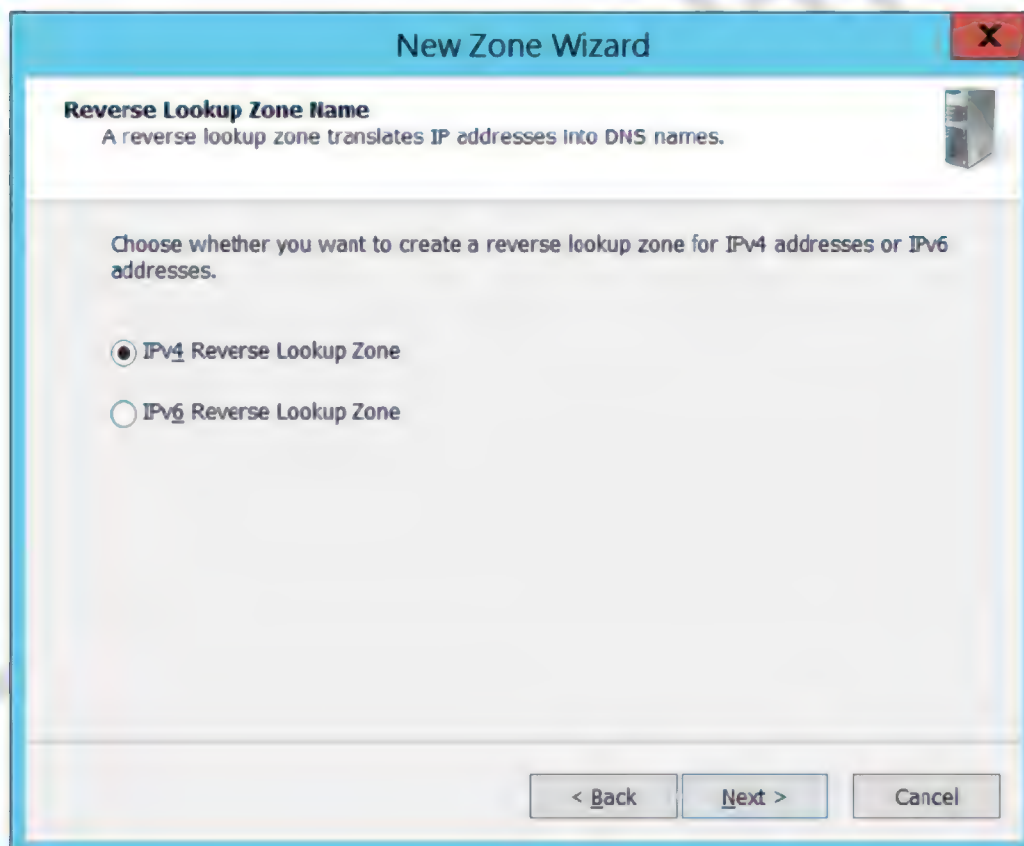
3. Click **Next**



4. Select **"Primary Zone"** and Remove the check box for **"Store the zone in Active Directory"**, click **Next**.




5. Check **IPv4 Reverse Lookup Zone**





6. In the network ID give the first three octets Ex: 10.0.0→Next



**New Zone Wizard**

**Reverse Lookup Zone Name**  
A reverse lookup zone translates IP addresses into DNS names.

To identify the reverse lookup zone, type the network ID or the name of the zone.

☒ **Network ID:**  
10 .0 .0 .

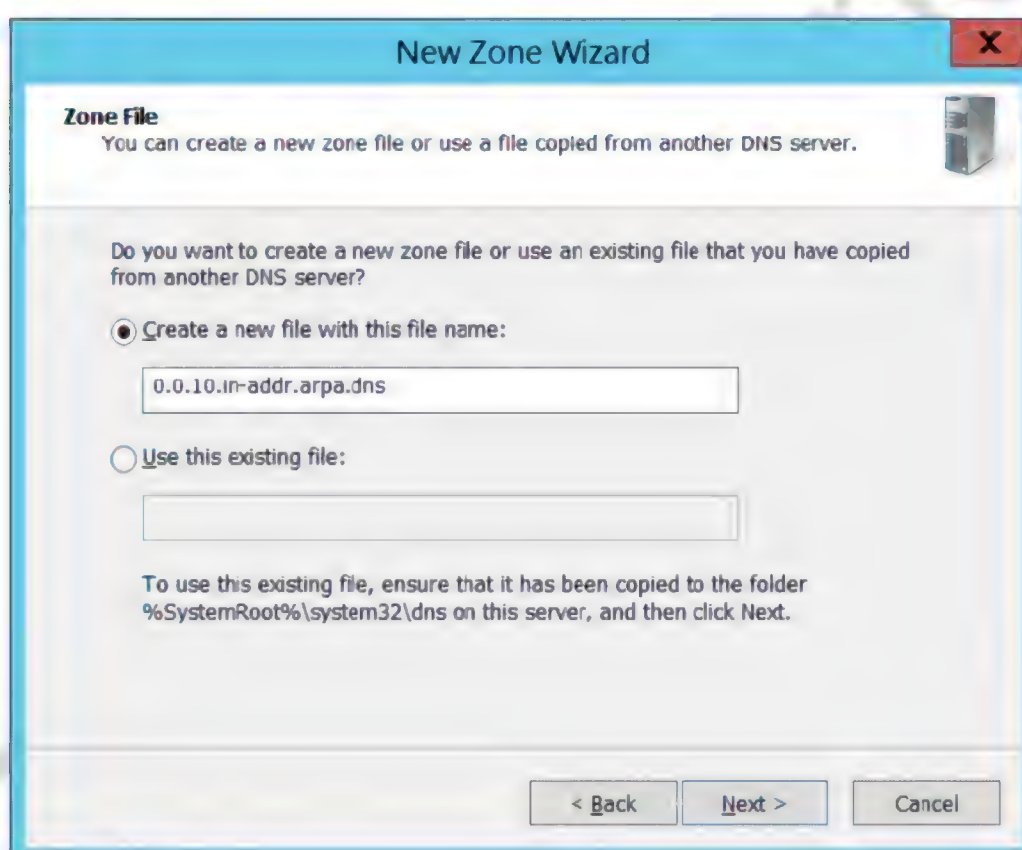
The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

☐ **Reverse lookup zone name:**  
0.0.10.in-addr.arpa

< Back   Next >   Cancel

7. Click **Next**



**New Zone Wizard**

**Zone File**  
You can create a new zone file or use a file copied from another DNS server.

Do you want to create a new zone file or use an existing file that you have copied from another DNS server?

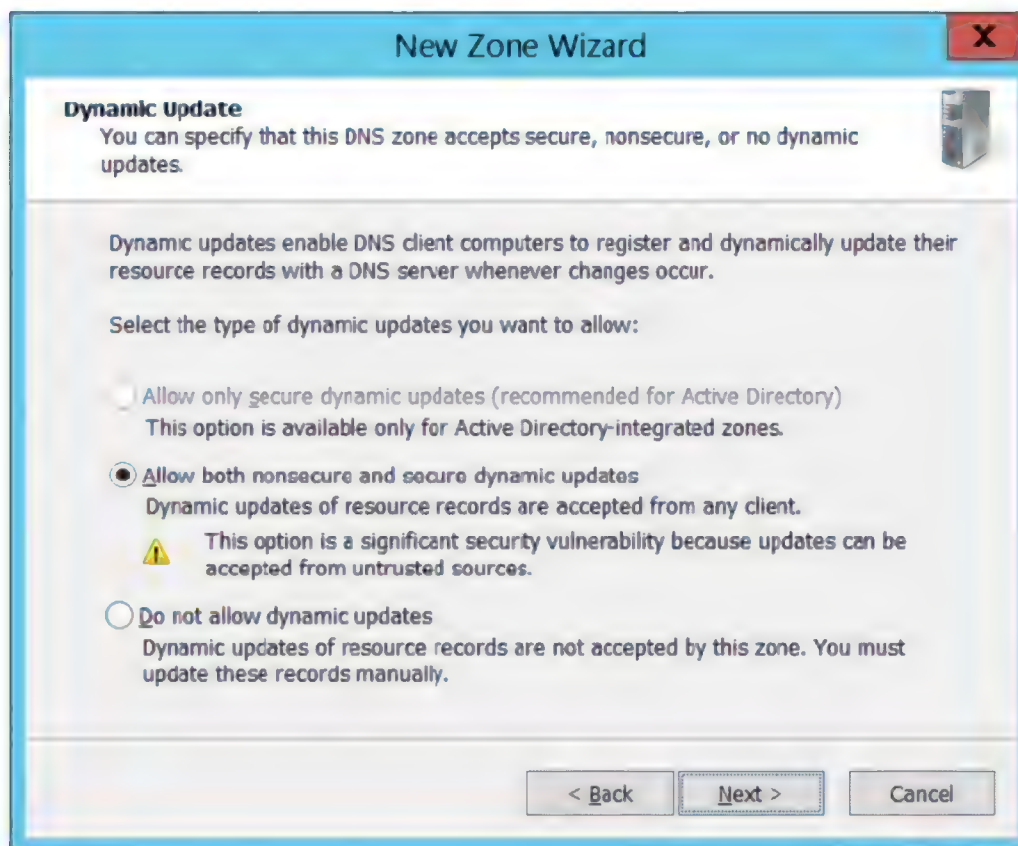
☒ **Create a new file with this file name:**  
0.0.10.in-addr.arpa.dns

☐ **Use this existing file:**  
[Empty text box]

To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.

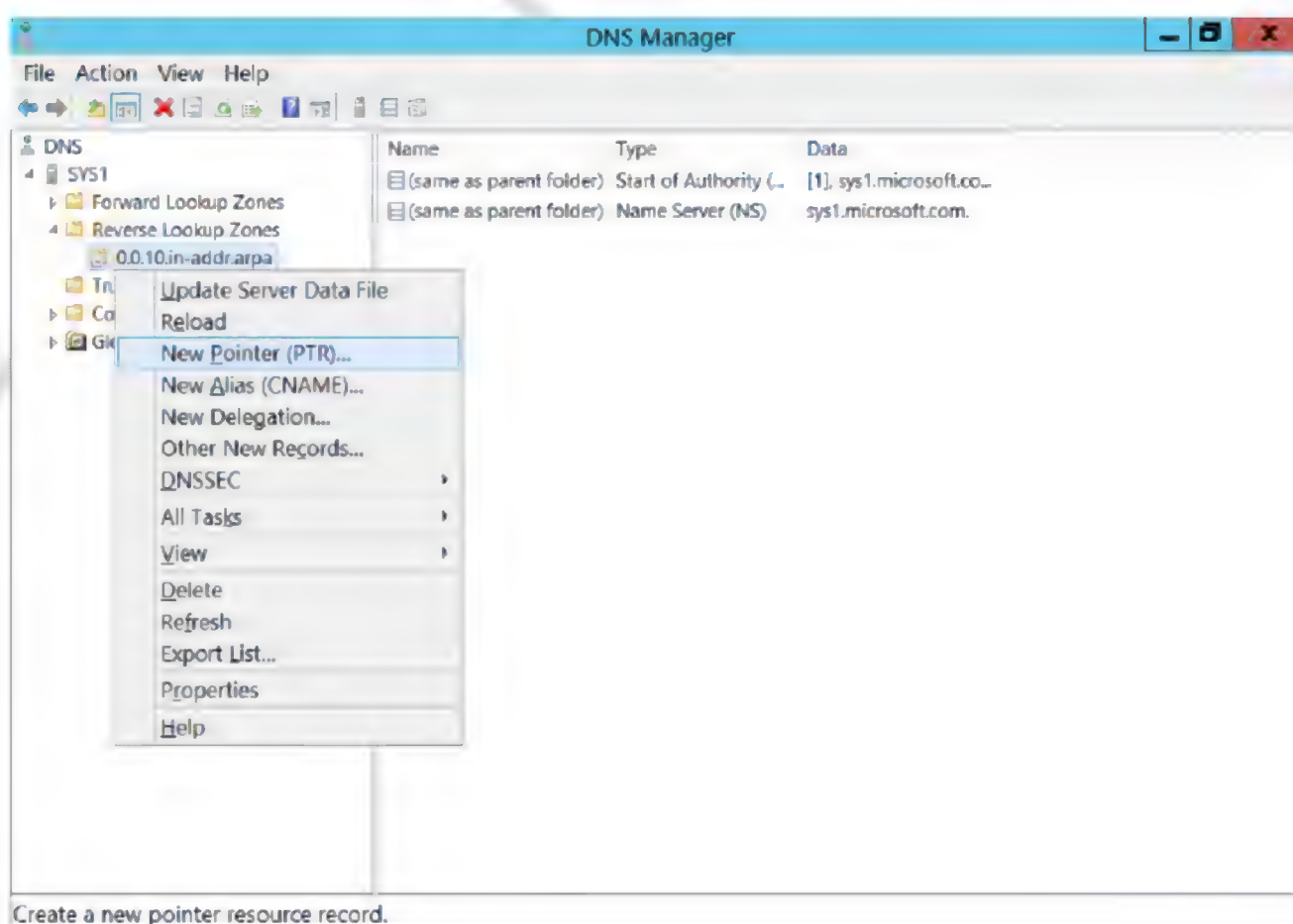
< Back   Next >   Cancel

8. In dynamic Update Select "**Allow both non-secure and secure dynamic update**" → click **Next**  
**finish**

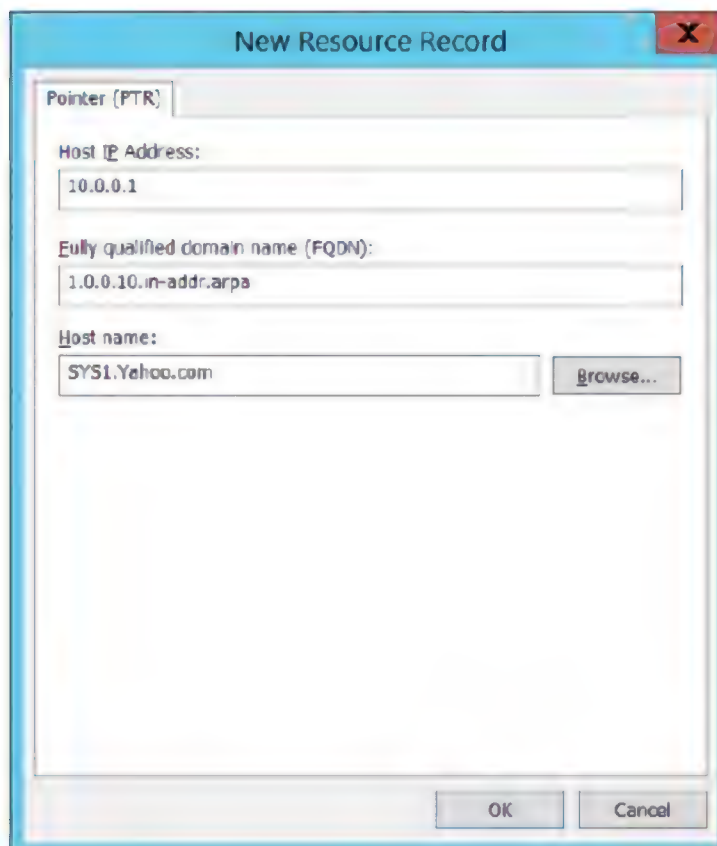


## Creating pointer record

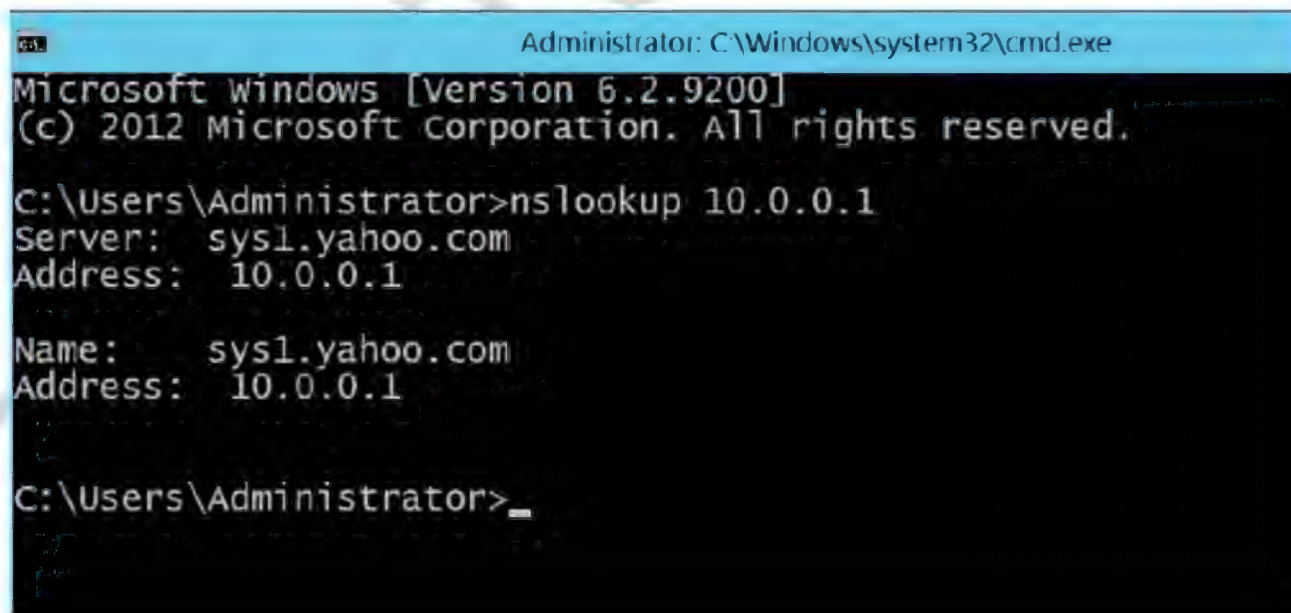
1. Go to Start, select **DNS**.
2. Expand Reverse lookup zone and Right click the zone → select **New Pointer**



3. In the pointer record give the fourth octet → click browse → double click server name (SYS1) → double click Forward Lookup Zone → double click the zone name (Yahoo.com) → double click the host name (SYS1) → OK

**Verification:**

1. Open the command prompt and type **nslookup 10.0.0.1**





## Lab – 51: Secondary DNS Zone

### Objective:

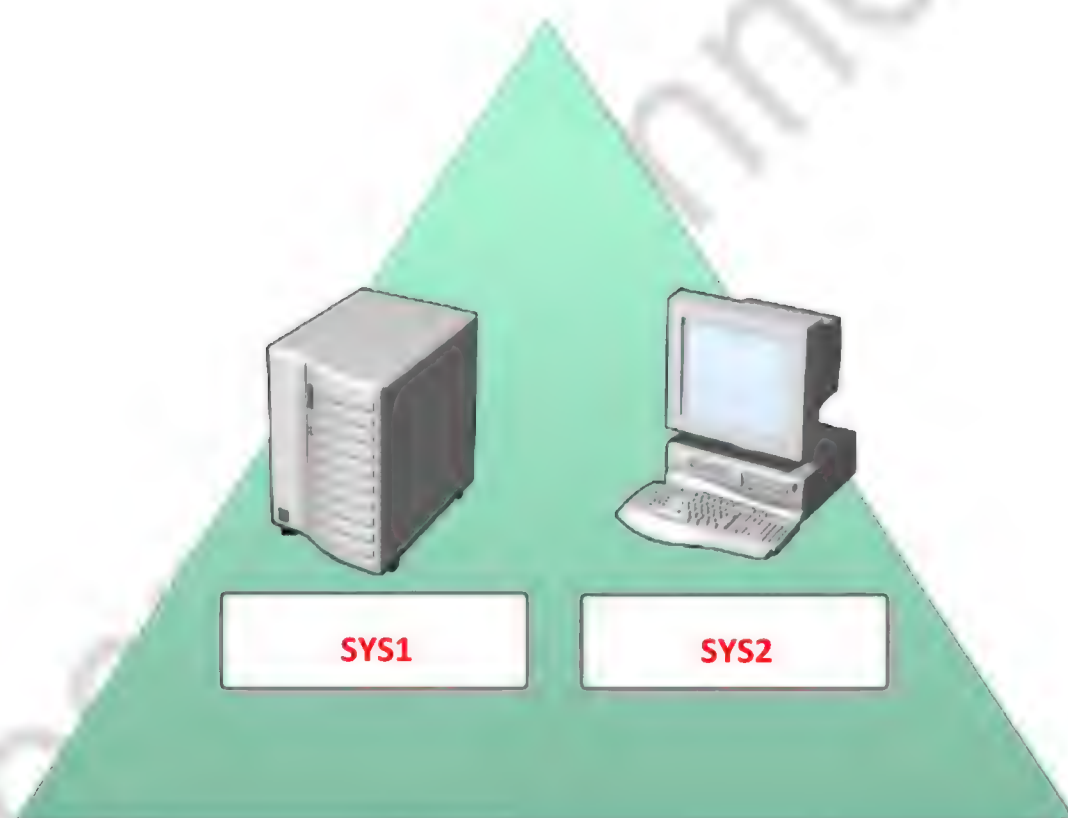
To create a secondary DNS zone as a backup to the primary zone

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### Member Server / DNS Server

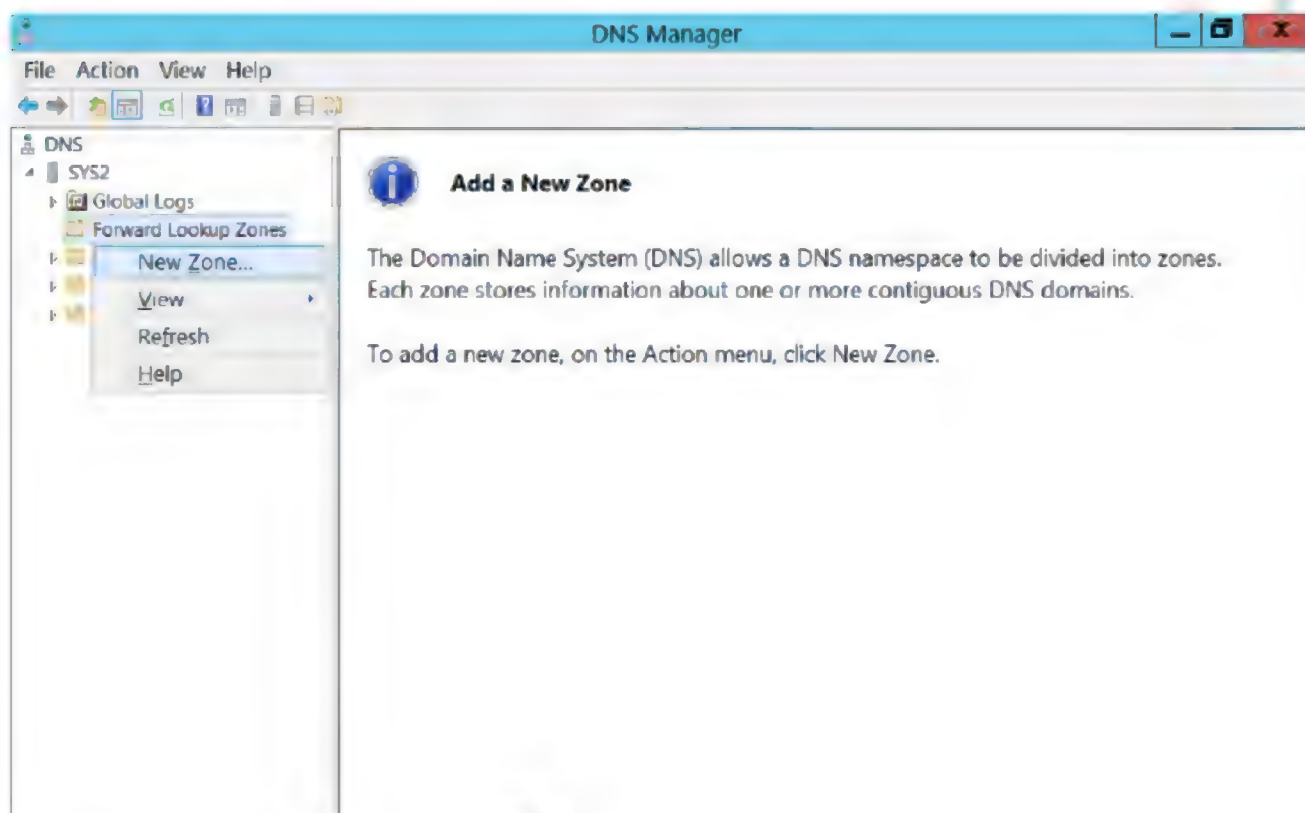
IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.2

## SYS1 - CONFIGURATION

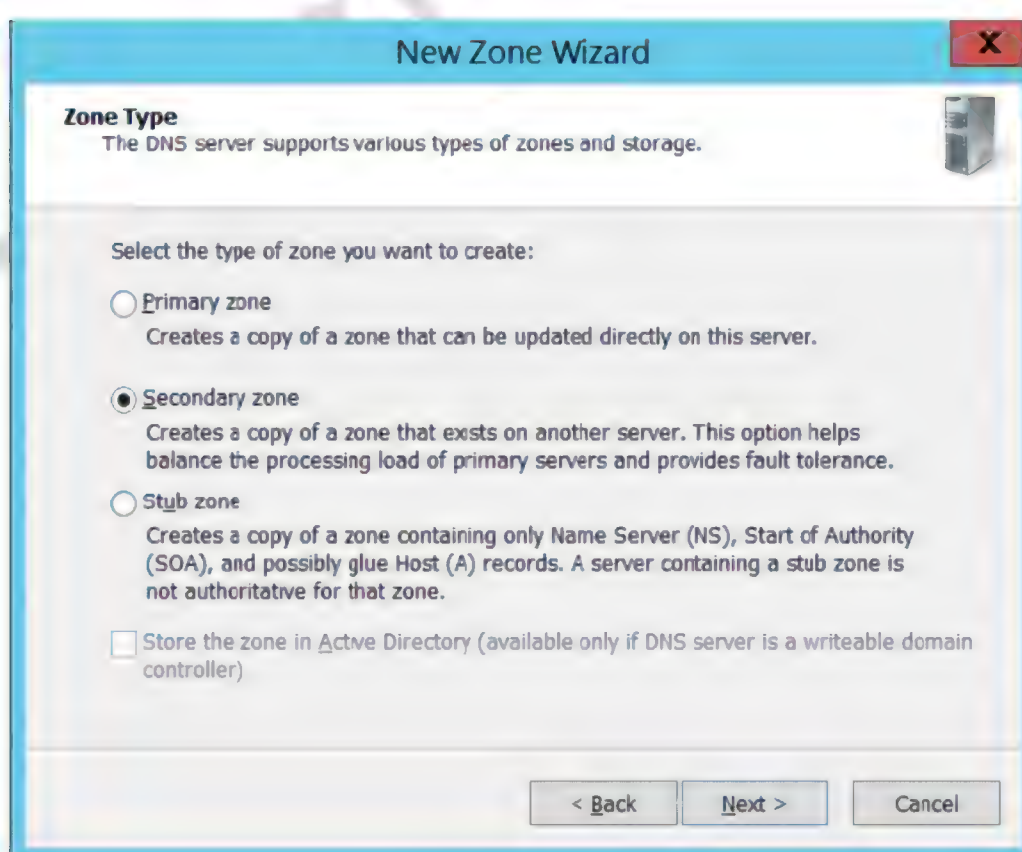
1. In **SYS1** one primary zone should be present. E.g.: Yahoo.com

## SYS2 - CONFIGURATION

1. Go to Start, select **DNS**.
2. In the DNS dialog box, expand the DNS server's name in the left pane. Right click **Forward Lookup Zones** → select **New Zone** → **Next**



3. Select **Secondary zone** → **Next**.



4. Give the name of **primary zone** → click **Next**.

**New Zone Wizard**

**Zone Name**  
What is the name of the new zone?

The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:  
yahoo.com

< Back   Next >   Cancel

5. Give the **IP address of primary zone** Ex: 10.0.0.1 → click **Next**.

**New Zone Wizard**

**Master DNS Servers**  
The secondary zone is copied from one or more DNS servers.

Specify the DNS servers from which you want to copy the zone. Servers are contacted in the order shown.

Master Servers:

IP Address	Server FQDN	Validated
<Click here to ...>		
✓ 10.0.0.1	sys1.yahoo.com	OK

Buttons: Delete, Up, Down

< Back   Next >   Cancel



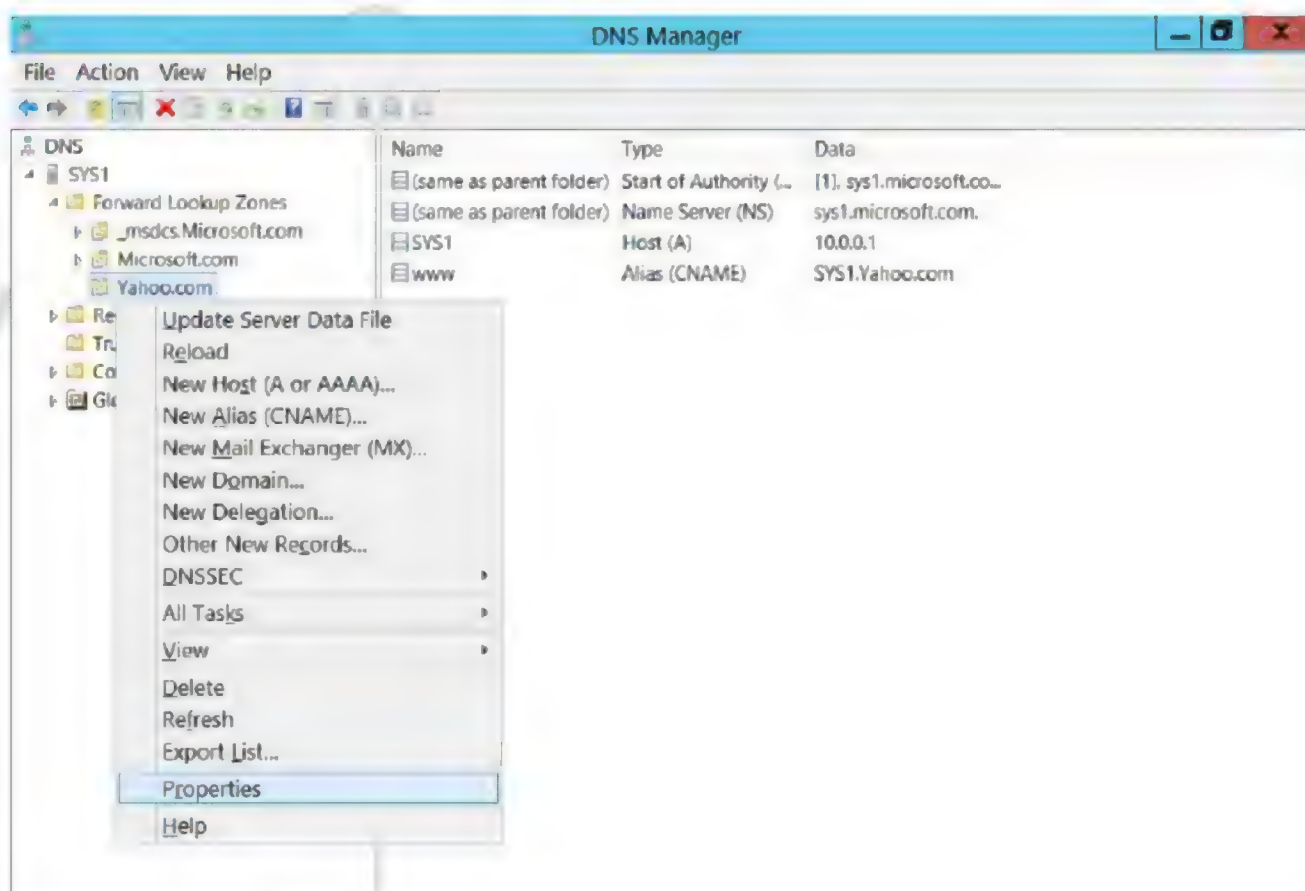
- Click **Next** → **Finish**.



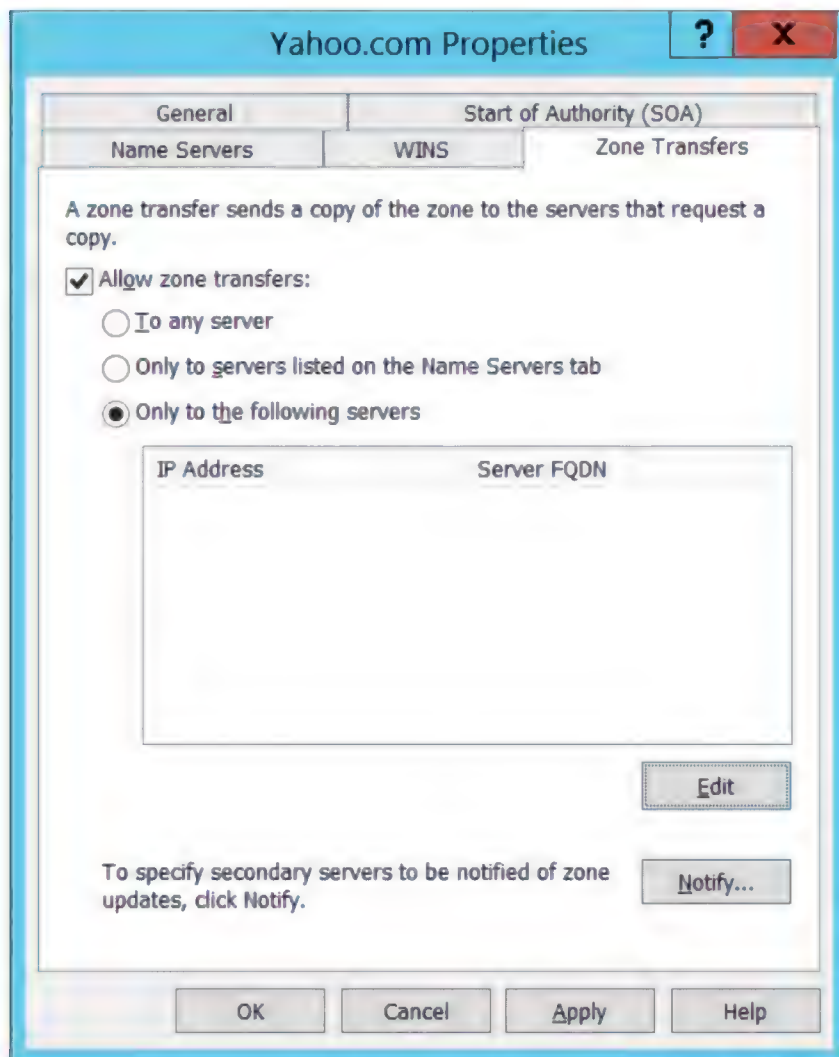
## Allow zone transfers to secondary zone

### SYS1-CONFIGURATION

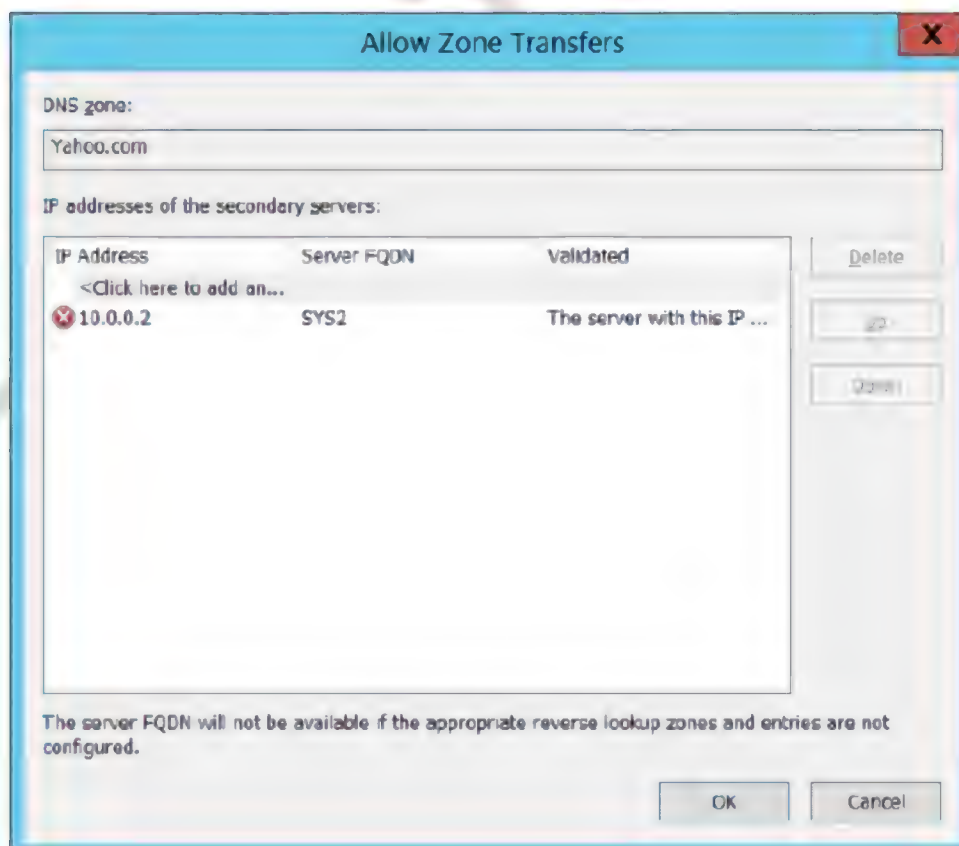
- Go to Start, select **DNS**.
- In the DNS dialog box, expand the DNS server's name in the left pane → Expand Forward Lookup Zone → right click **primary zone** → select **Properties**.



3. Select **Zone Transfers** Tab → check the box for **Allow zone transfers** → select **Only to the following servers**.



4. Click **Edit** and mention the **Computer IP Address of secondary zone**. Click **Notify** → Select to **the following servers** → and mention the **Computer IP Address of secondary zone**.



5. Click **Apply** → **OK** → Again Click **Apply** → **OK**.

## Lab – 52: Creating a Stub DNS zone

### Objective:

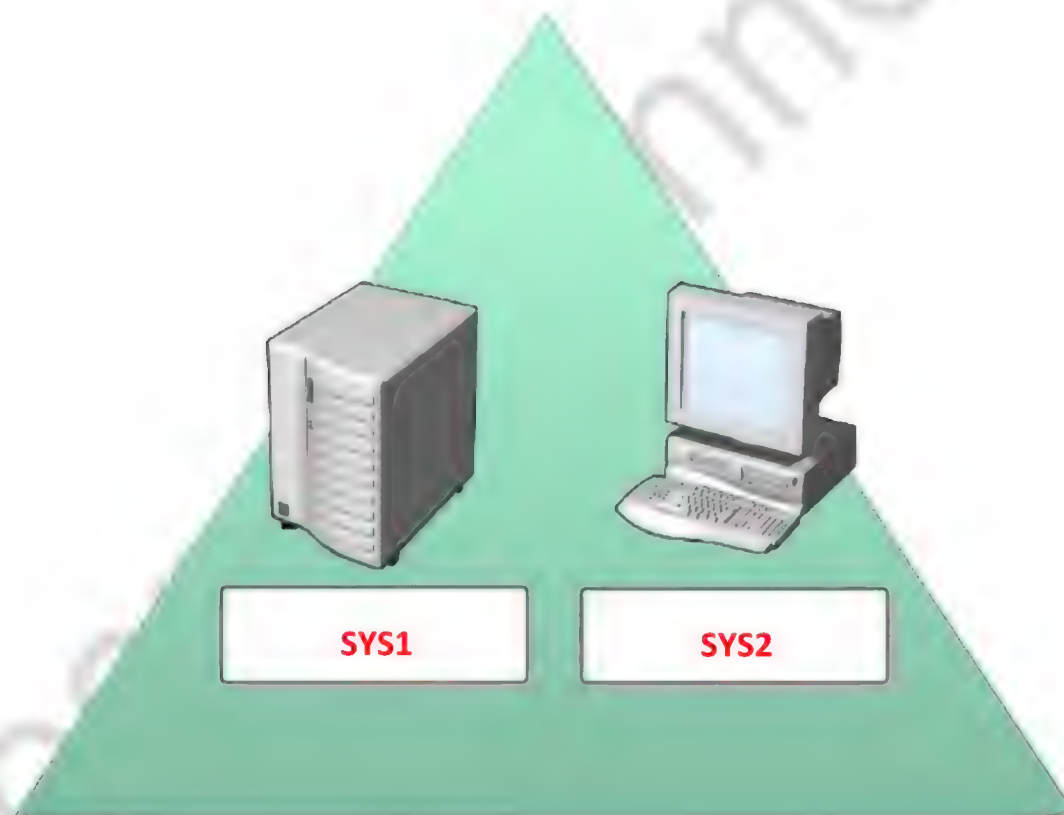
To create a stub DNS zone for fast name resolution

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address 10.0.0.1  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.1

#### SYS2

##### Member Server / DNS Server

IP Address 10.0.0.2  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.2

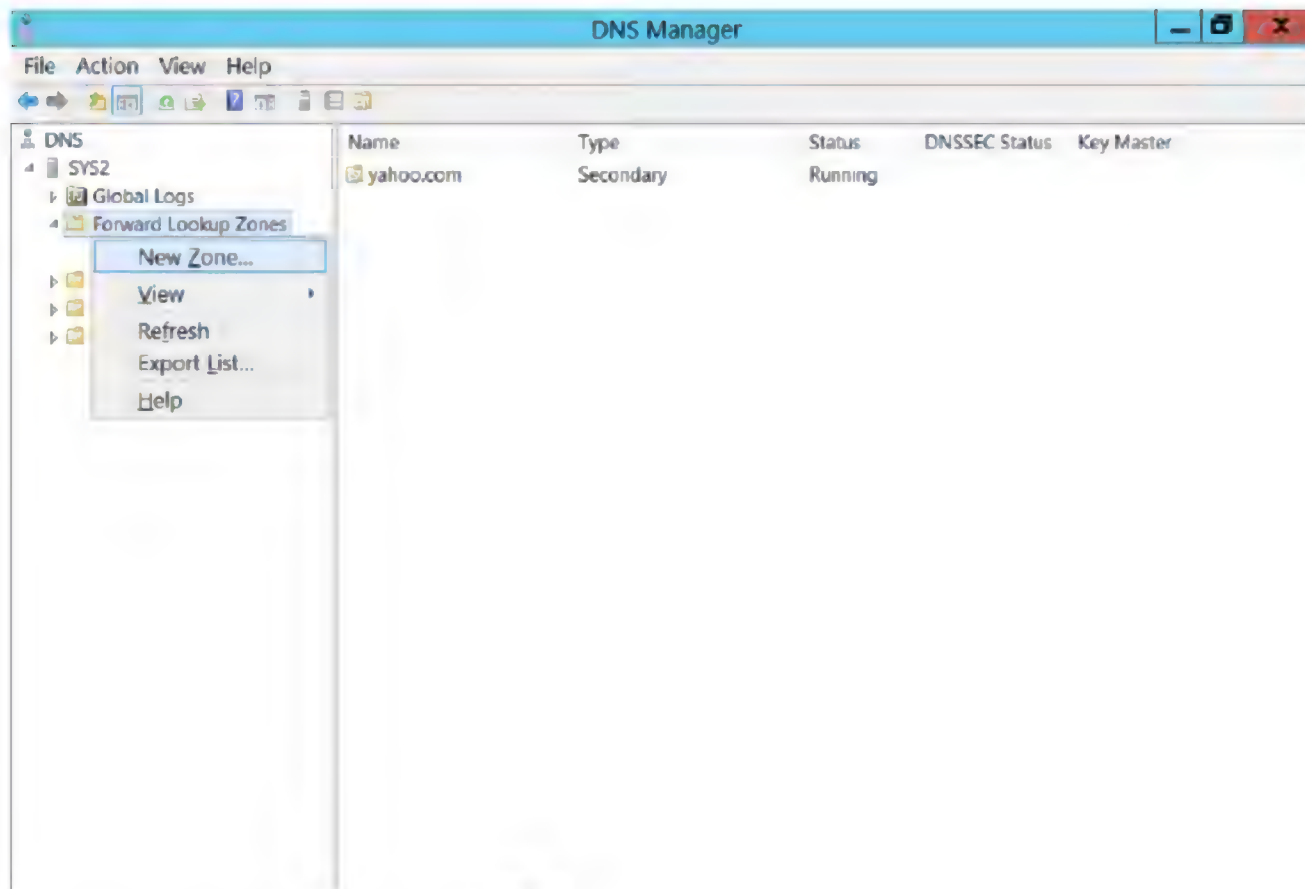


## SYS1-CONFIGURATION

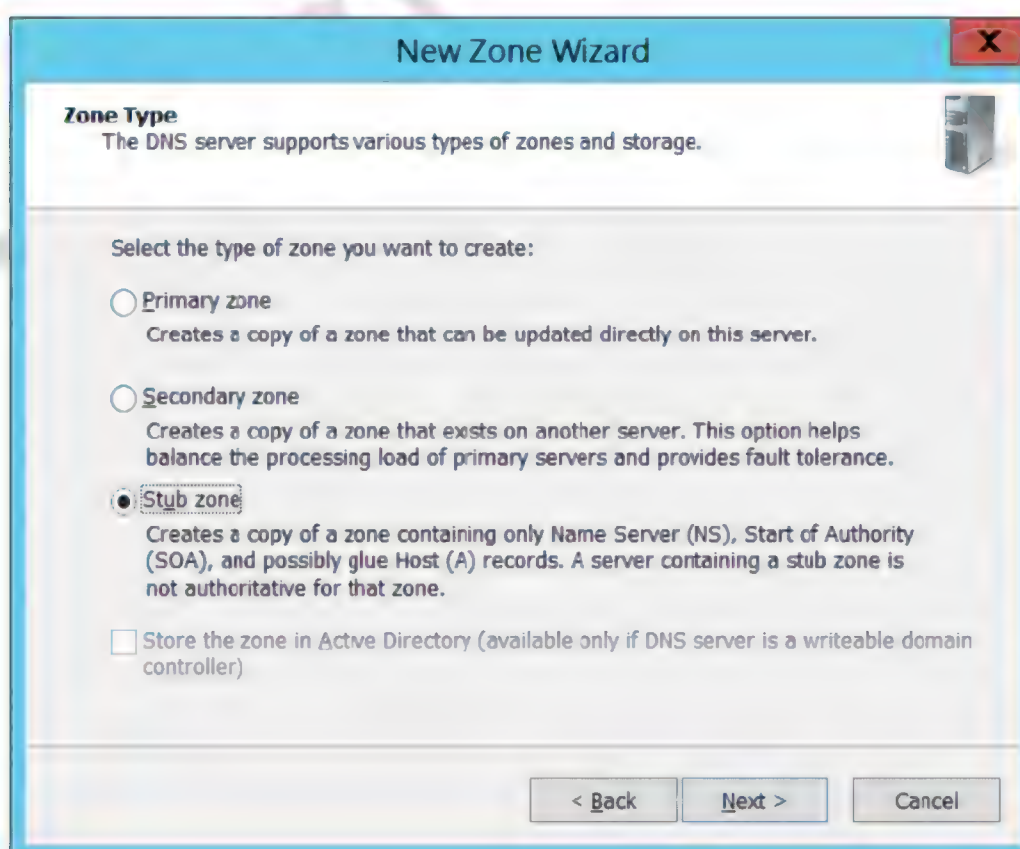
1. Log on to **SYS1** and create a primary zone **Msn.com** along with host and alias records.

## SYS2-CONFIGURATION

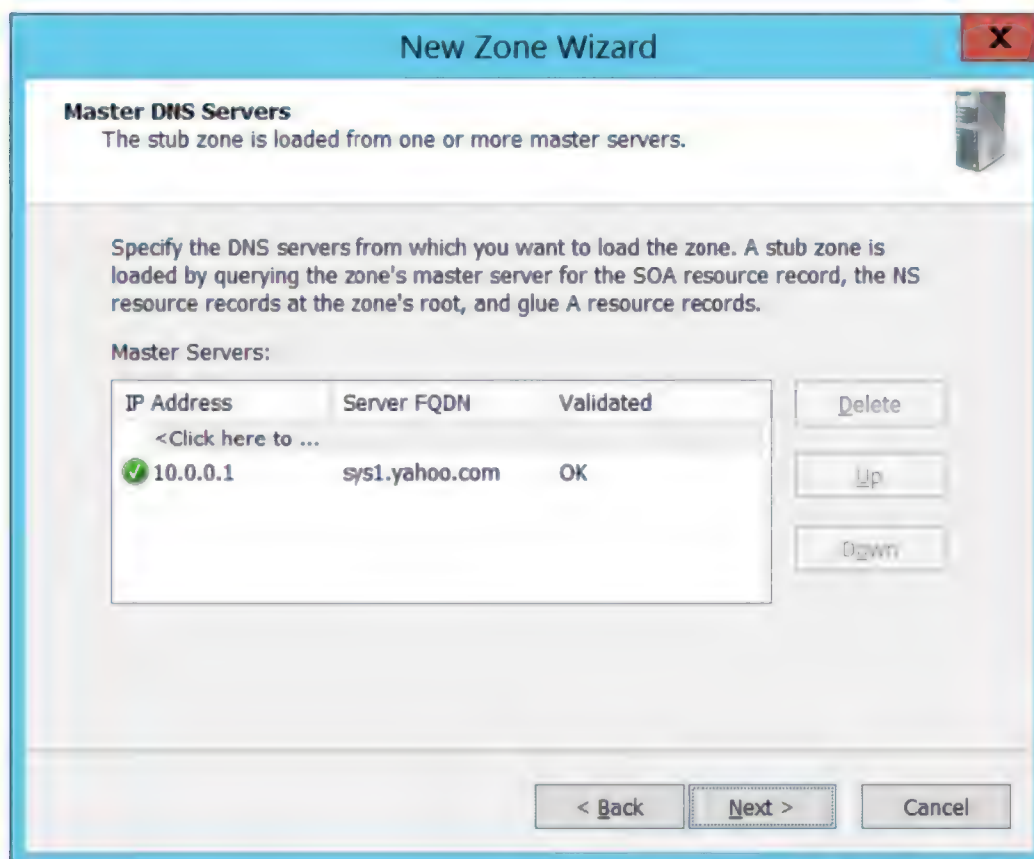
1. Log on to **SYS2** and Go to Start, select **DNS**.
2. In the DNS dialog box, Expand **DNS Server name** in the left pane, right click **Forward Lookup Zones** → Select **New Zone** → Next



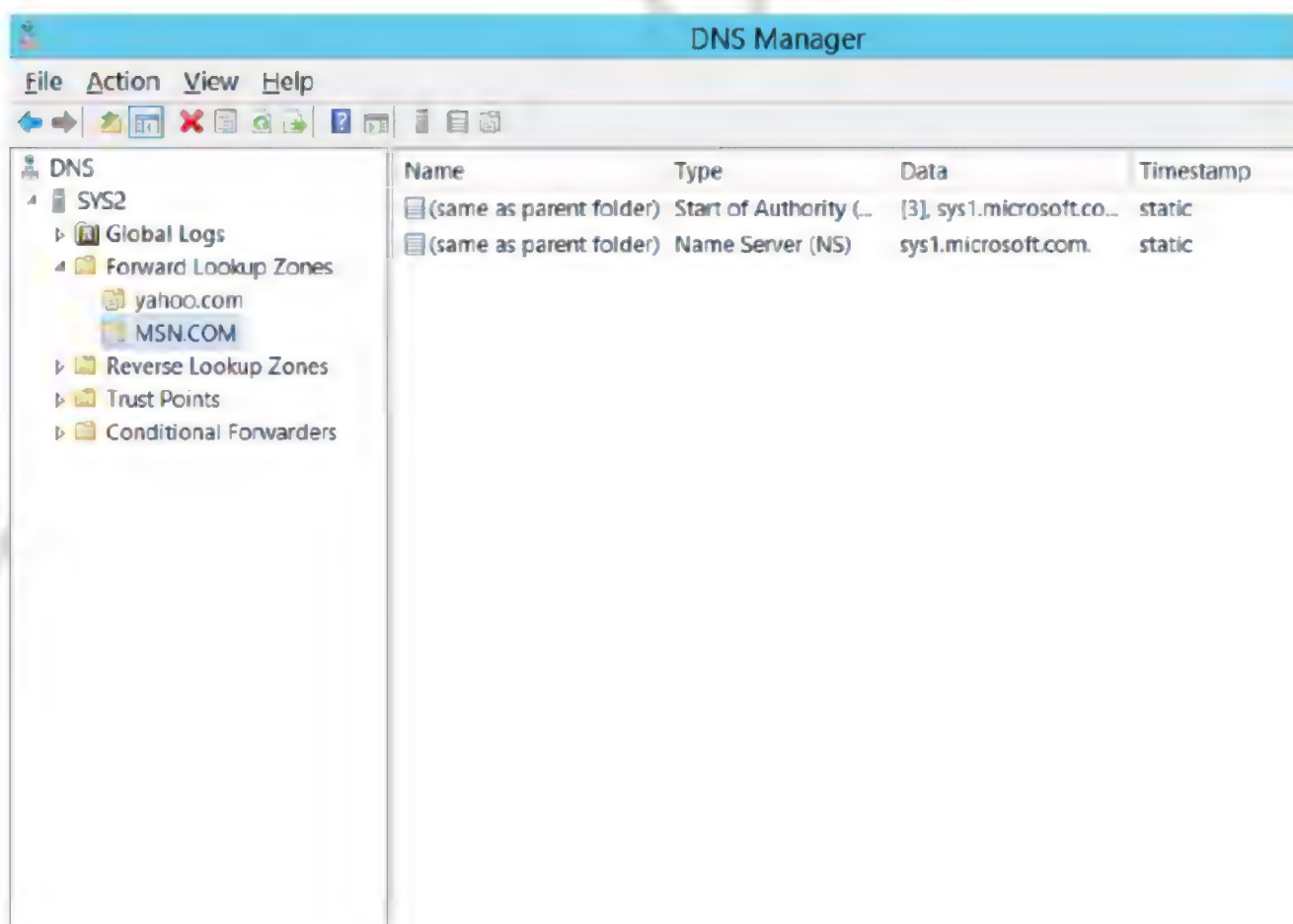
4. Select **Stub zone** → Next



5. Give the name of **primary zone (Msn.com)** → click **Next**.
6. Give the **IP address of primary zone** Ex: 10.0.0.1 → click **Next**.



7. Click Next → **Finish**.
8. **Refresh the stub zone** and verify for records.



## Lab – 53: Creating Active Directory Integrated Primary DNS Zone

### Objective:

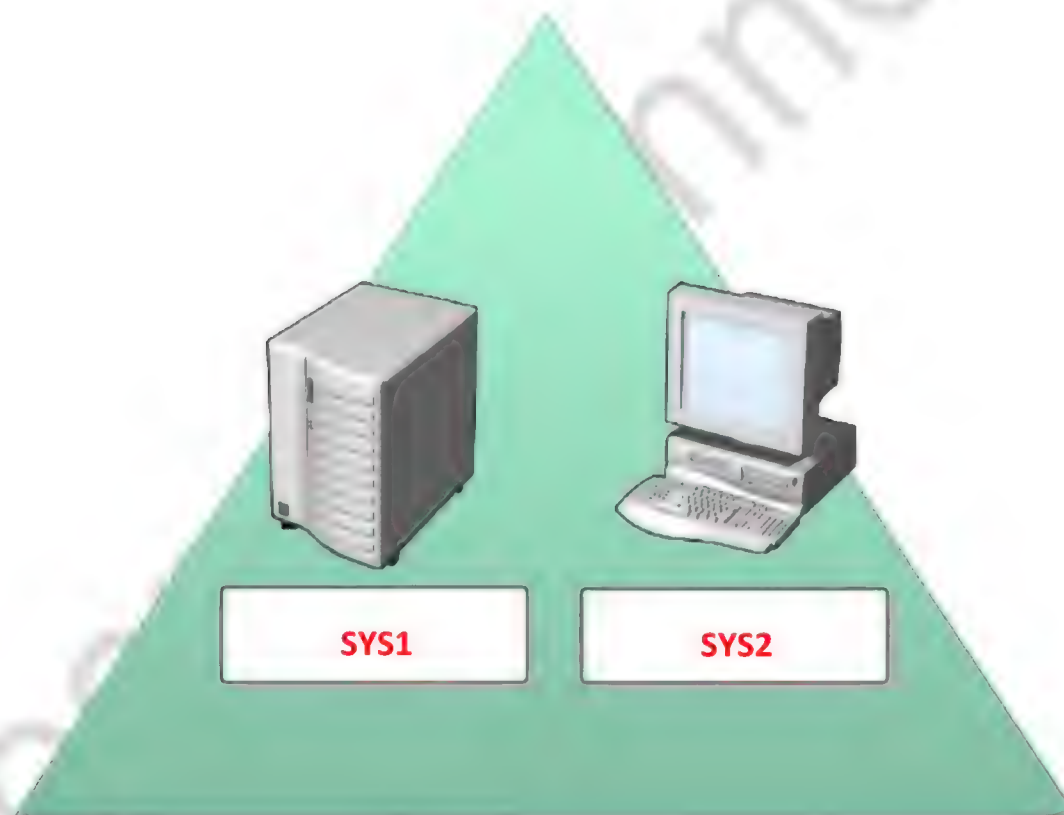
To create and troubleshoot active directory integrated DNS zones

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

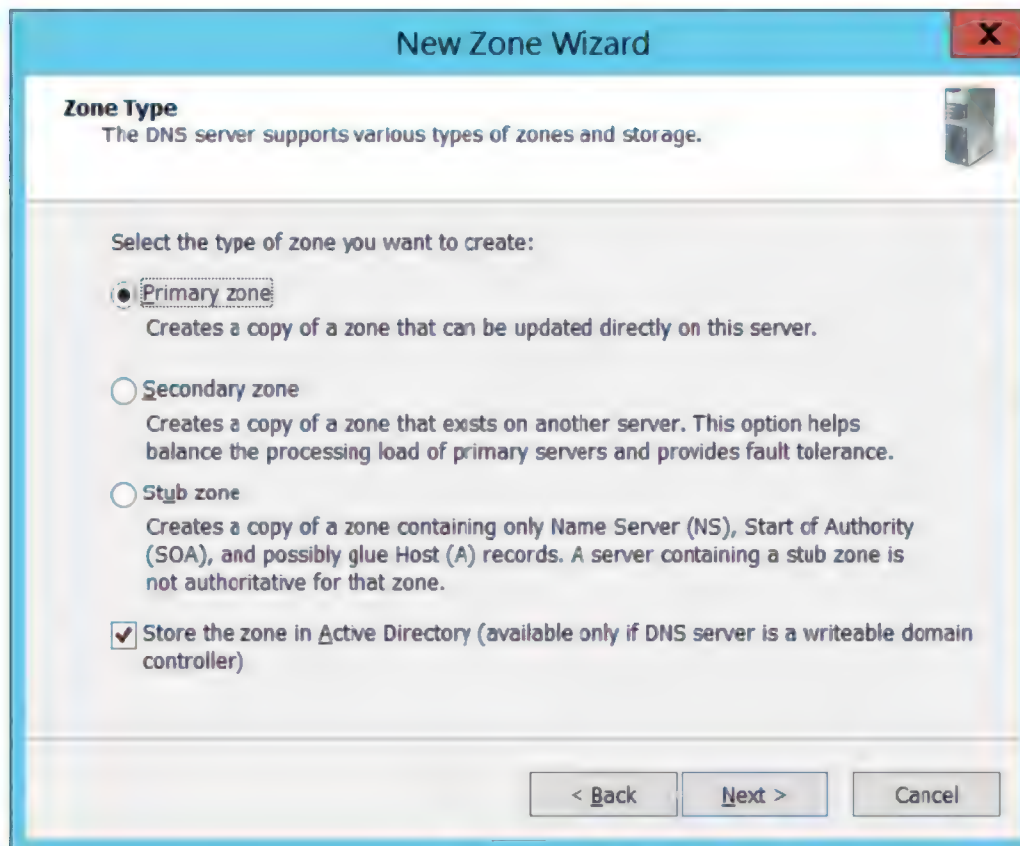
##### Member Server / DNS Server

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.2

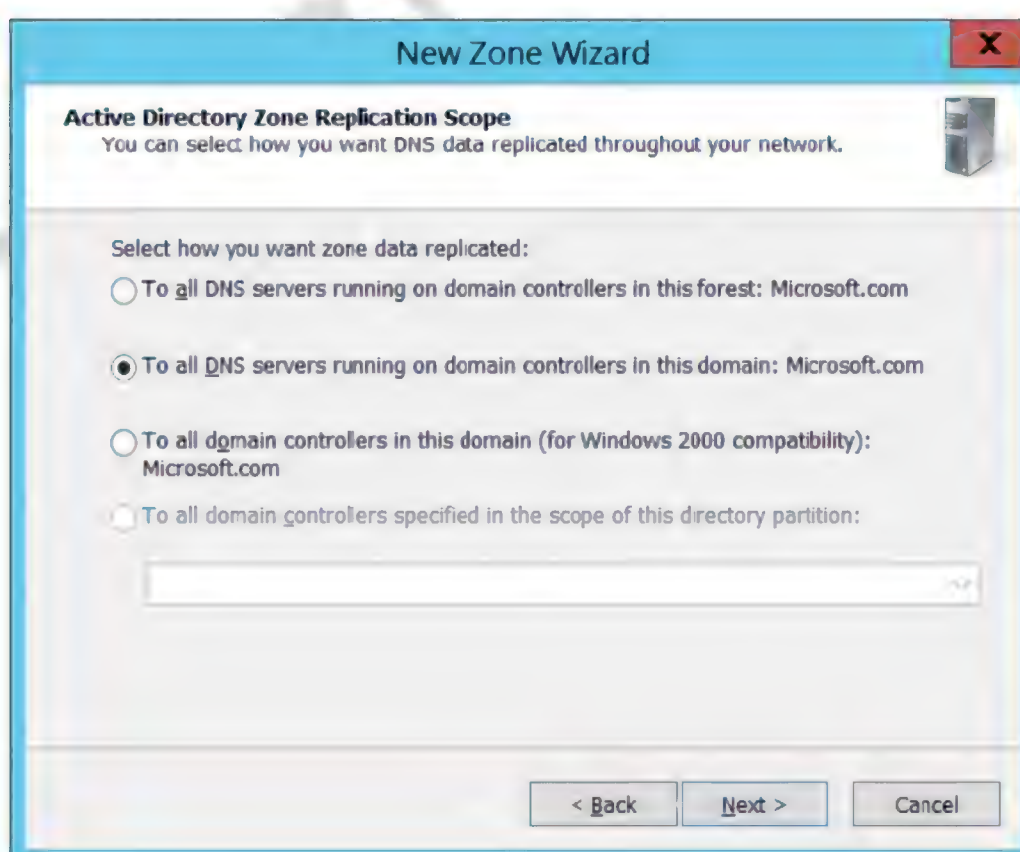


**Steps:**

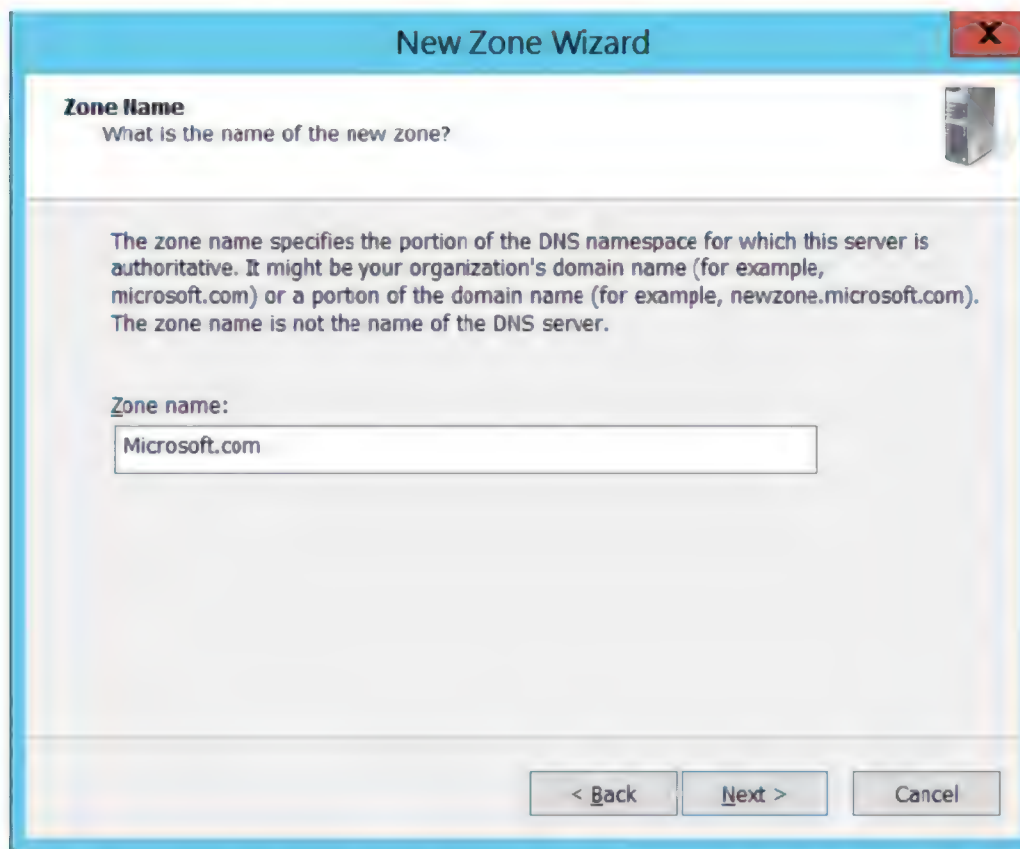
1. Go to Start, select **DNS**.
2. In the DNS dialog box, expand the DNS server's name in the left pane, right click **Forward Lookup Zones** → select **New Zone**
3. Click **Next** → Accept the default option of "**Primary Zone**" and Select the check box for "**Store the zone in Active Directory**" → click **Next**.



4. In AD Zone Replication Scope, Select the "**To all DNS servers in Active directory domain**" → click **Next**.



5. Give the Zone Name same as the **Domain Name** (Ex: Microsoft.com), click **Next**.



**New Zone Wizard**

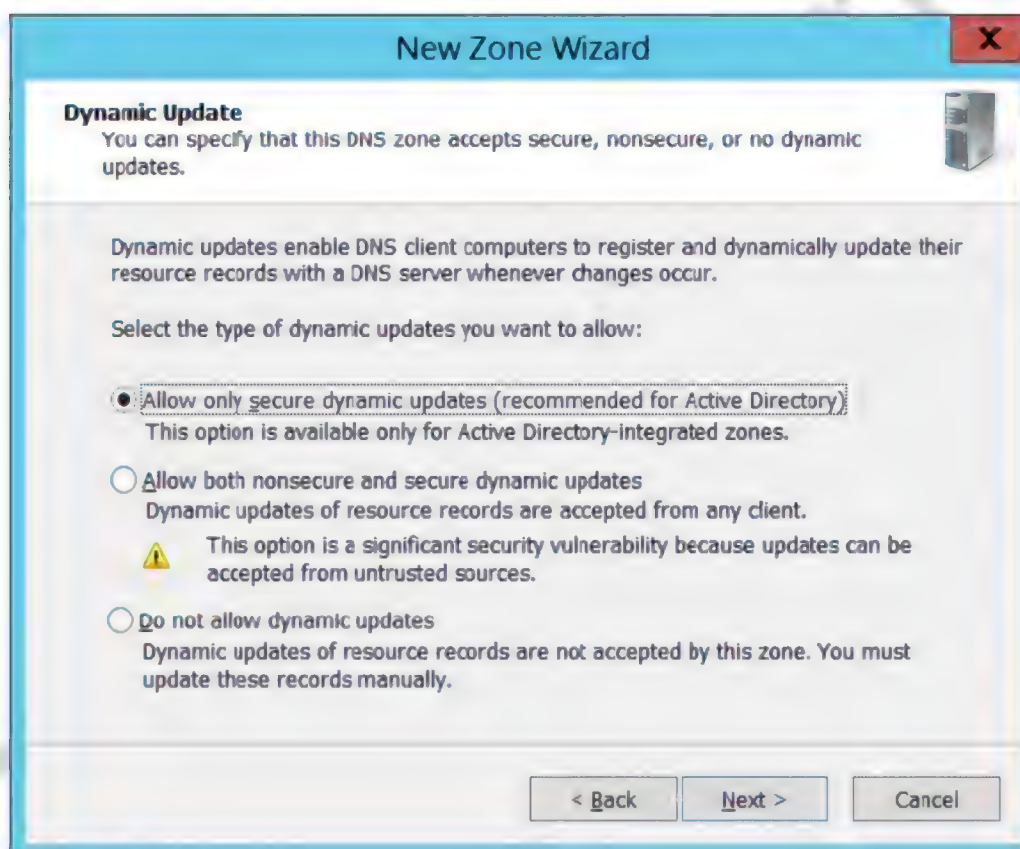
**Zone Name**  
What is the name of the new zone?

The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:  
Microsoft.com

< Back   Next >   Cancel

6. Select **"Allow only secure and dynamic update"** → click **Next** → **Finish**.




**New Zone Wizard**

**Dynamic Update**  
You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.

Dynamic updates enable DNS client computers to register and dynamically update their resource records with a DNS server whenever changes occur.

Select the type of dynamic updates you want to allow:

- ☒ **Allow only secure dynamic updates (recommended for Active Directory)**  
This option is available only for Active Directory-integrated zones.
- ☐ **Allow both nonsecure and secure dynamic updates**  
Dynamic updates of resource records are accepted from any client.  
 This option is a significant security vulnerability because updates can be accepted from untrusted sources.
- ☐ **Do not allow dynamic updates**  
Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

< Back   Next >   Cancel

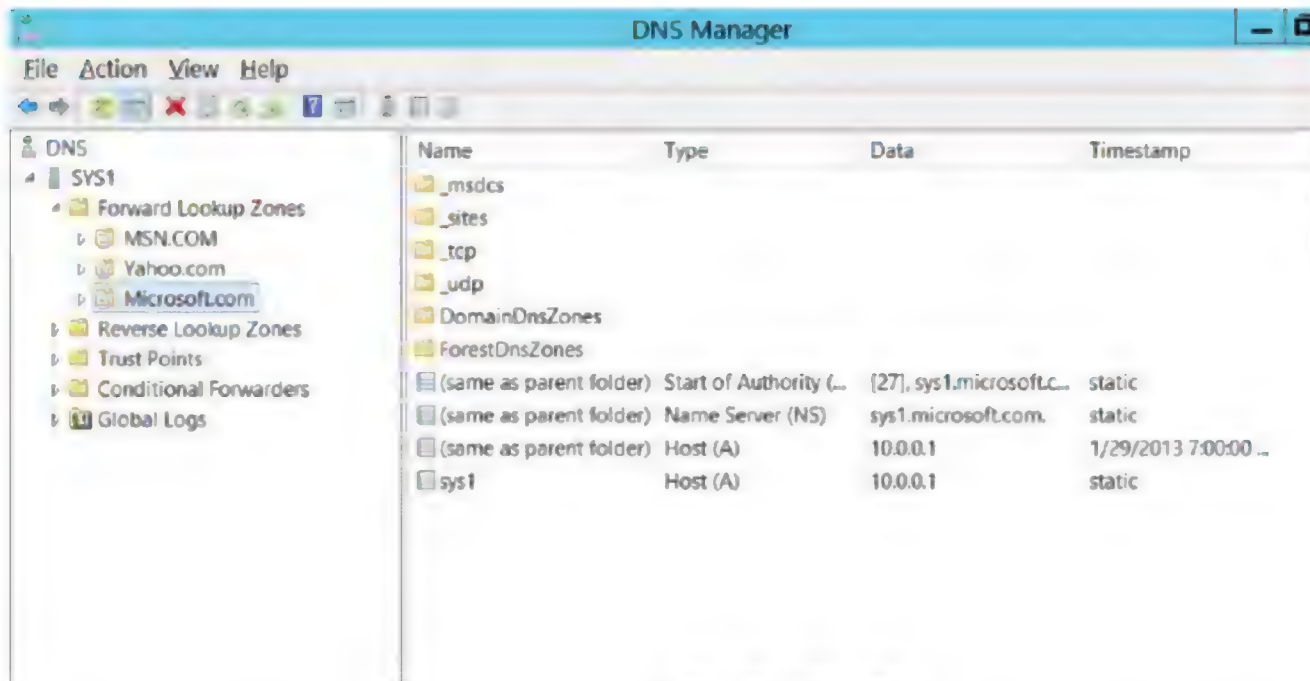


### Verification:

1. Verify for the Service records in Microsoft.com zone.

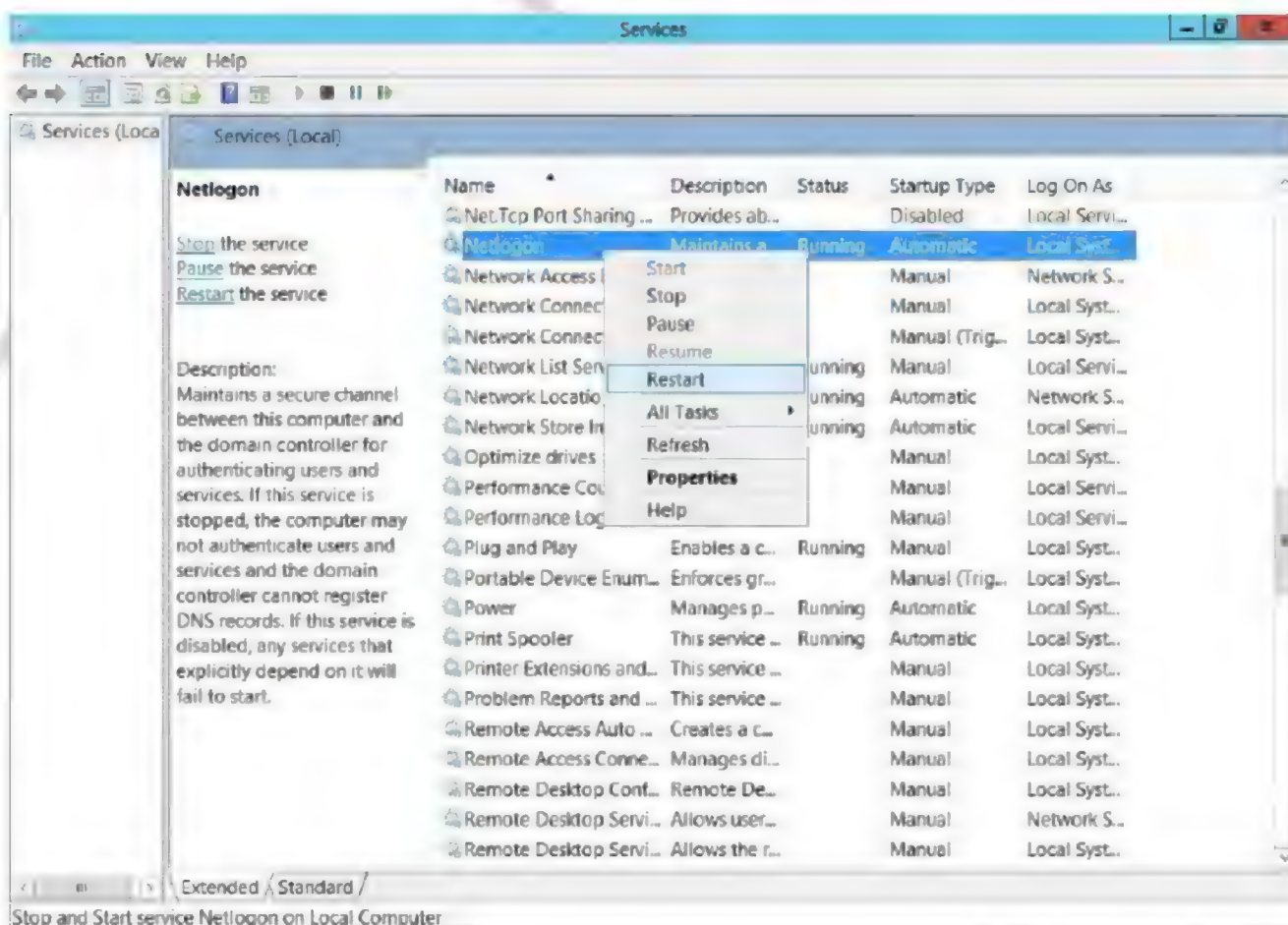
**NOTE:** Service records are available only for the zone with the domain name.

2. In **DC** by default the service records are created in the DNS server in the zone with domain name.



**Note:** To get the missing records restart the services **Netlogon** and **DNS Server**.

3. Go to Start, type Services in Search Apps, and select Services
4. Right click **Netlogon** and click **Restart**, Right click **DNS Server** and click **Restart**.





## Lab – 54: Conditional DNS Forwarders

### Objective:

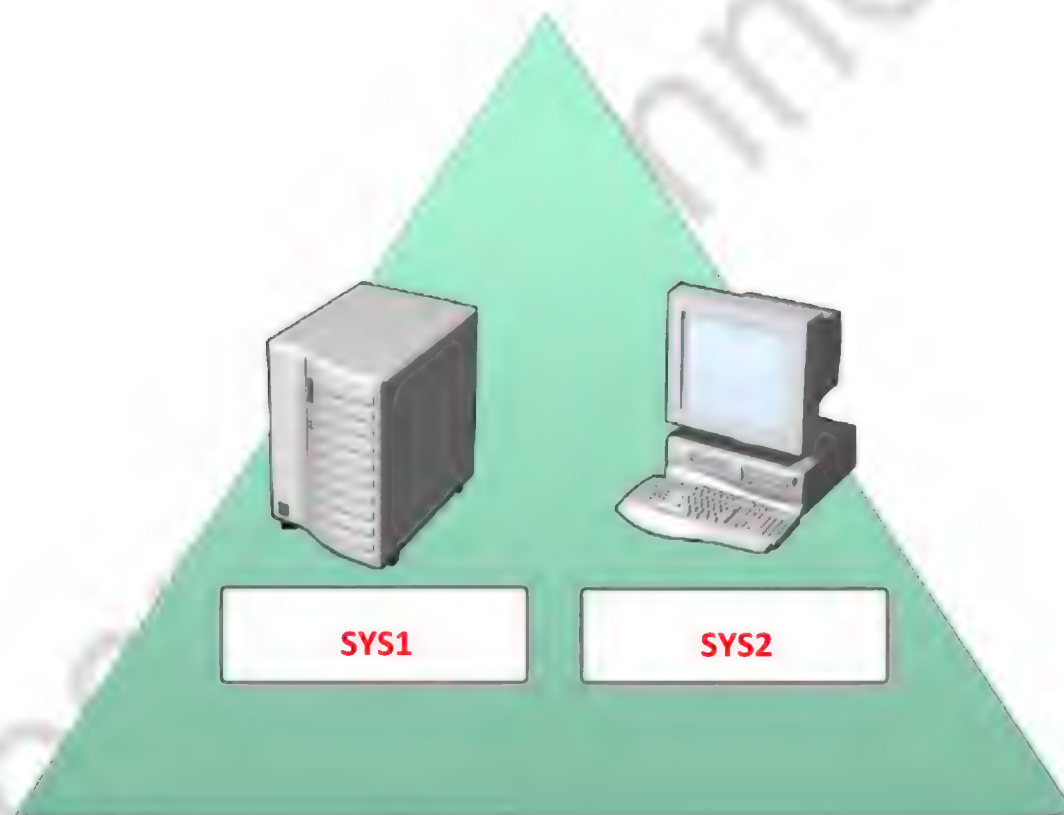
To configure conditional DNS forwarders

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address 10.0.0.1  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.1

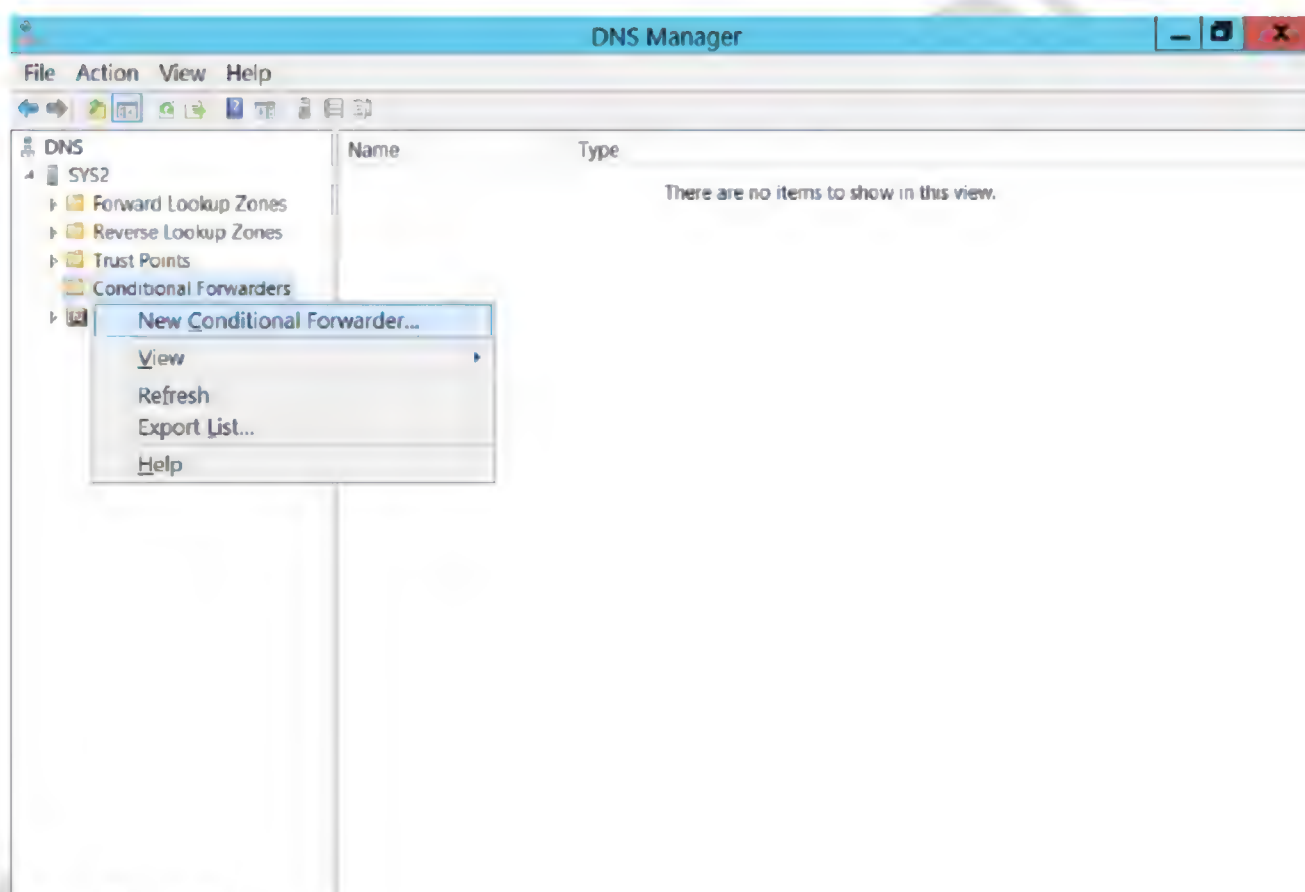
#### SYS2

##### Member Server / DNS Server

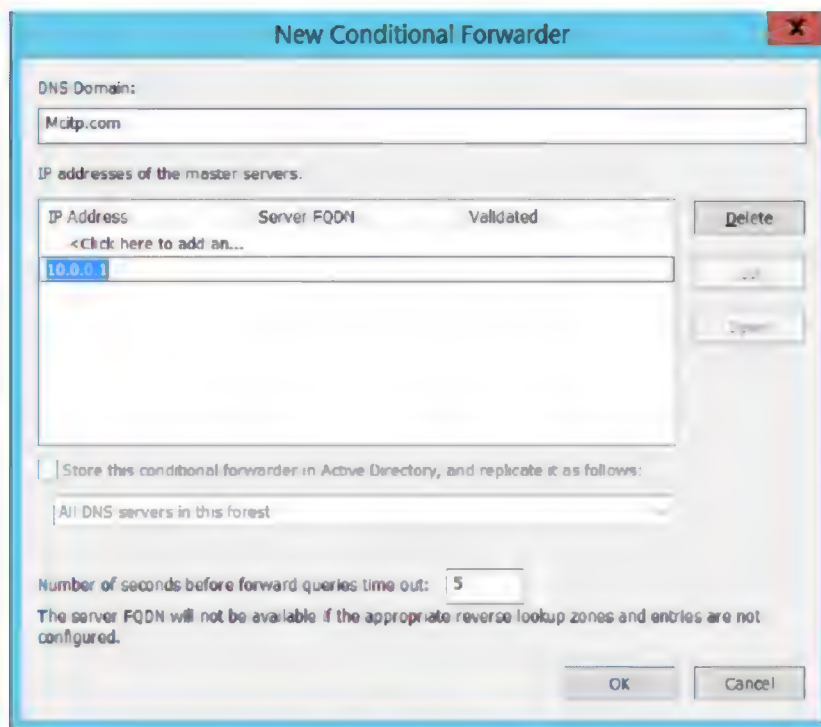
IP Address 10.0.0.2  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.2

**Steps:**

1. In **SYS1** create a zone with the name Ex: **MCITP.COM** with host and alias records.
2. In **SYS1** open the command prompt and type ping [www.MCITP.COM](http://www.MCITP.COM)
3. There will be a reply from 10.0.0.1
4. In **SYS2** assign the **IP Address** and **Preferred DNS** as **10.0.0.2**
5. In **SYS2** open the command prompt and type ping [www.MCITP.COM](http://www.MCITP.COM)
6. There will not be any reply because the information is in 10.0.0.1
7. If **SYS2** has to resolve the query then configure forwarders in **SYS2** properties.
8. Go to DNS dialog box in **SYS2** → Right click **conditional forwarders** → select **New conditional forwarders**



9. Mention the DNS Domain as **MCITP.COM** and add the IP address of primary zone.



10. In **SYS2** open the command prompt and type ping [www.MCITP.COM](http://www.MCITP.COM)
11. There will be a reply from 10.0.0.1

**Note:** Only MCITP.COM names can be resolved with the above process.



## Lab – 55: DNS Forwarders

### Objective:

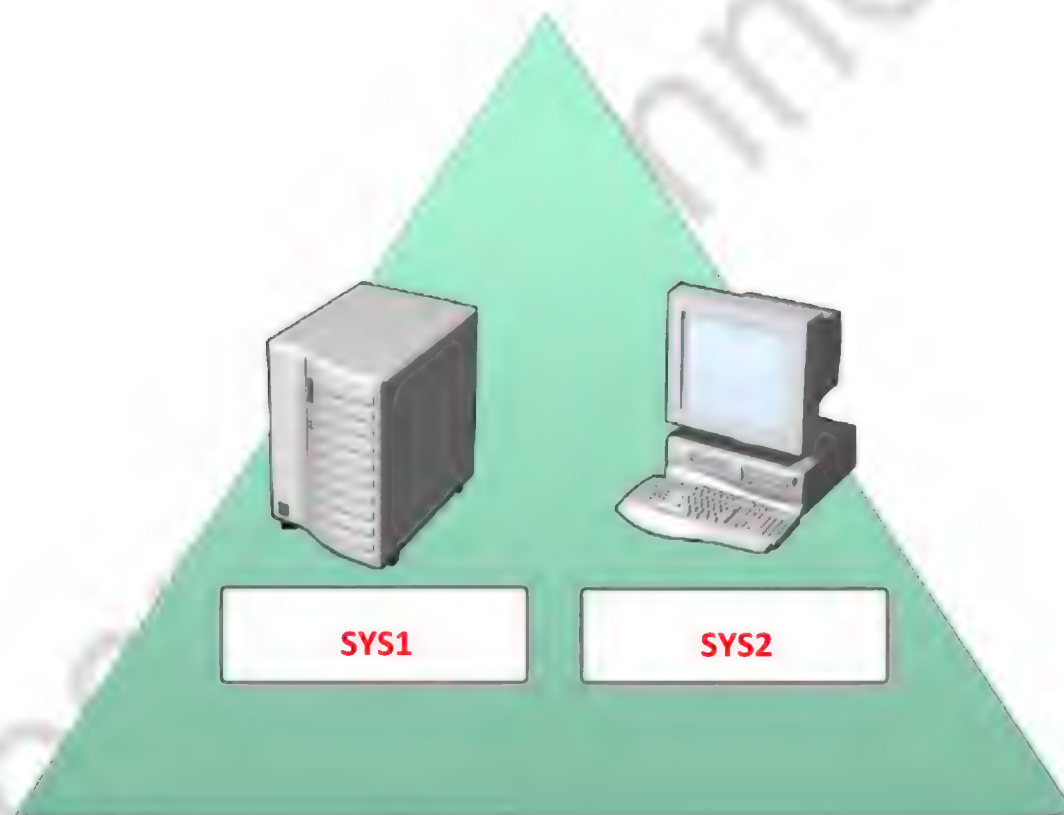
To configure DNS forwarders

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address 10.0.0.1  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.1

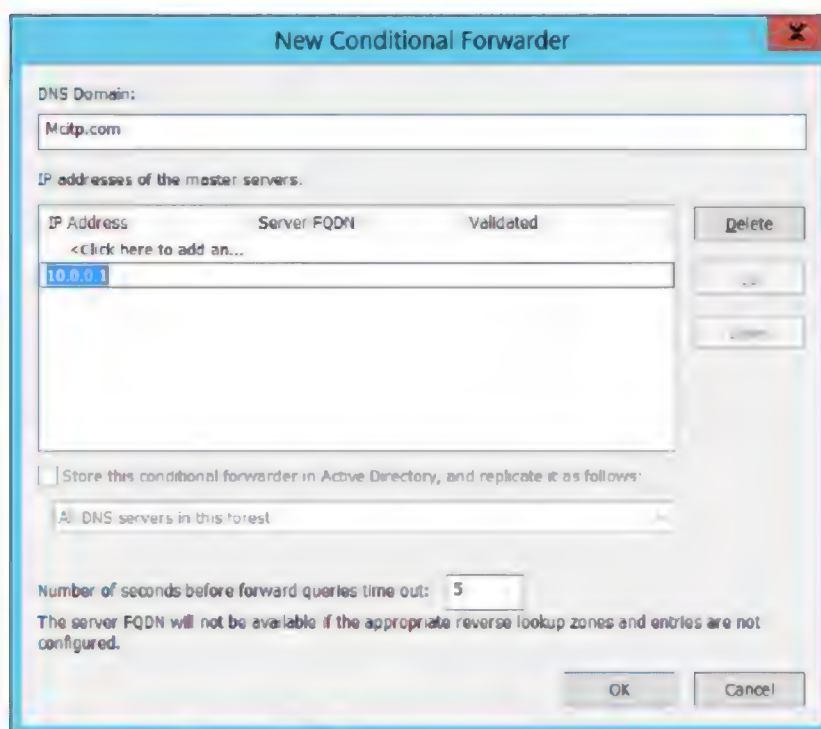
#### SYS2

##### Member Server / DNS Server

IP Address 10.0.0.2  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.2

**Steps:**

1. In **SYS1** create a zone with the domain name Ex: **Microsoft.com** with host and alias records.
2. In **SYS1** open the command prompt and type ping [www.Microsoft.com](http://www.Microsoft.com)
3. There will be a reply from 10.0.0.1
4. In **SYS2** assign the **IP Address** and **Preferred DNS** as **10.0.0.2**
5. In **SYS2** open the command prompt and type ping [www.Microsoft.com](http://www.Microsoft.com)
6. There will not be any reply because the information is in 10.0.0.1
7. If **SYS2** has to resolve the query then configure forwarders in **SYS2** properties.
8. Open DNS in **SYS2** → Right click **SYS2** → select properties → select forwarders → click Edit.
9. Mention the IP address of primary zone → click **OK** → click **OK**.



10. In **SYS2** open the command prompt and type ping [www.Microsoft.com](http://www.Microsoft.com)
11. There will be a reply from 10.0.0.1

## Lab – 56: DNS Root Hints

### Objective:

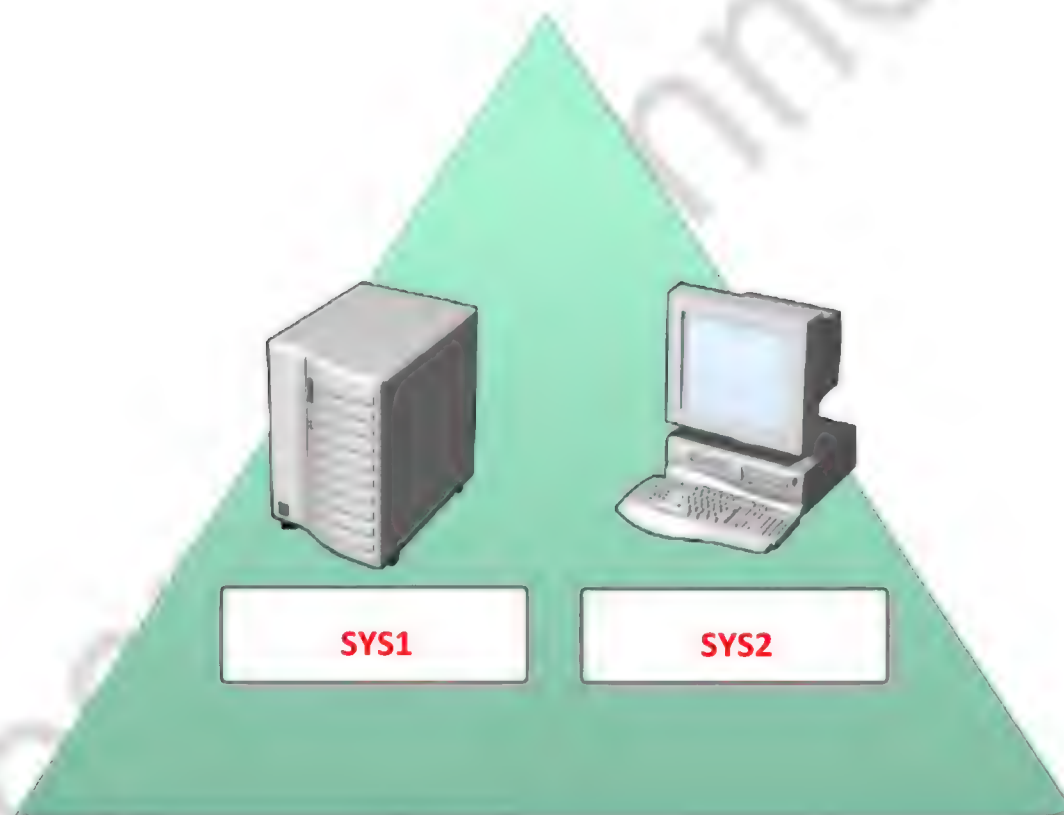
To verify DNS root hints

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

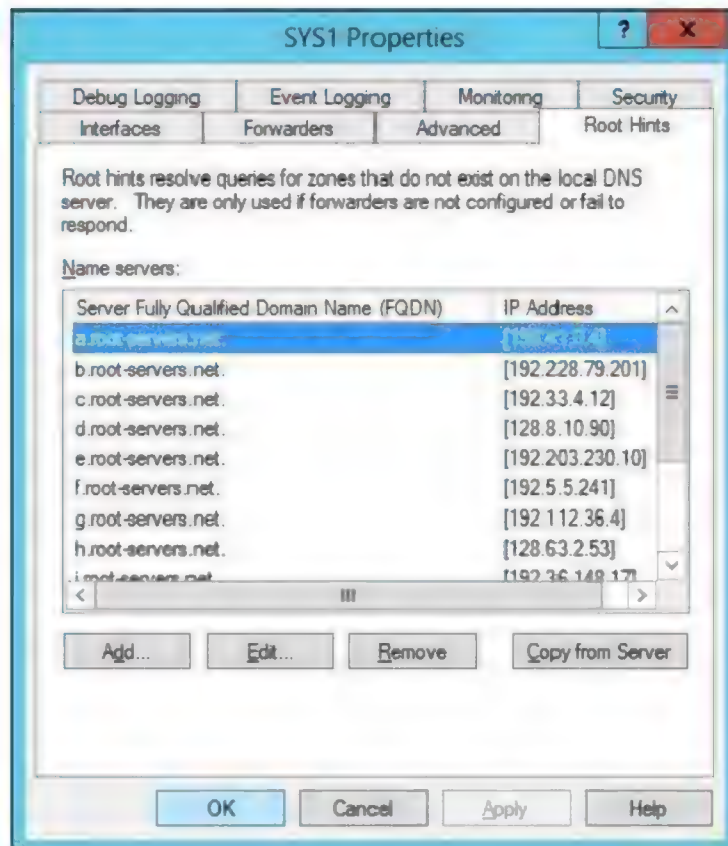
##### Member Server / DNS Server

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.2



**Steps:**

1. Root hints contain the information of 13 root servers
2. Open DNS → Right click the system name → select Properties → select **Root Hints**



## Lab – 57: DNS Cache

### Objective:

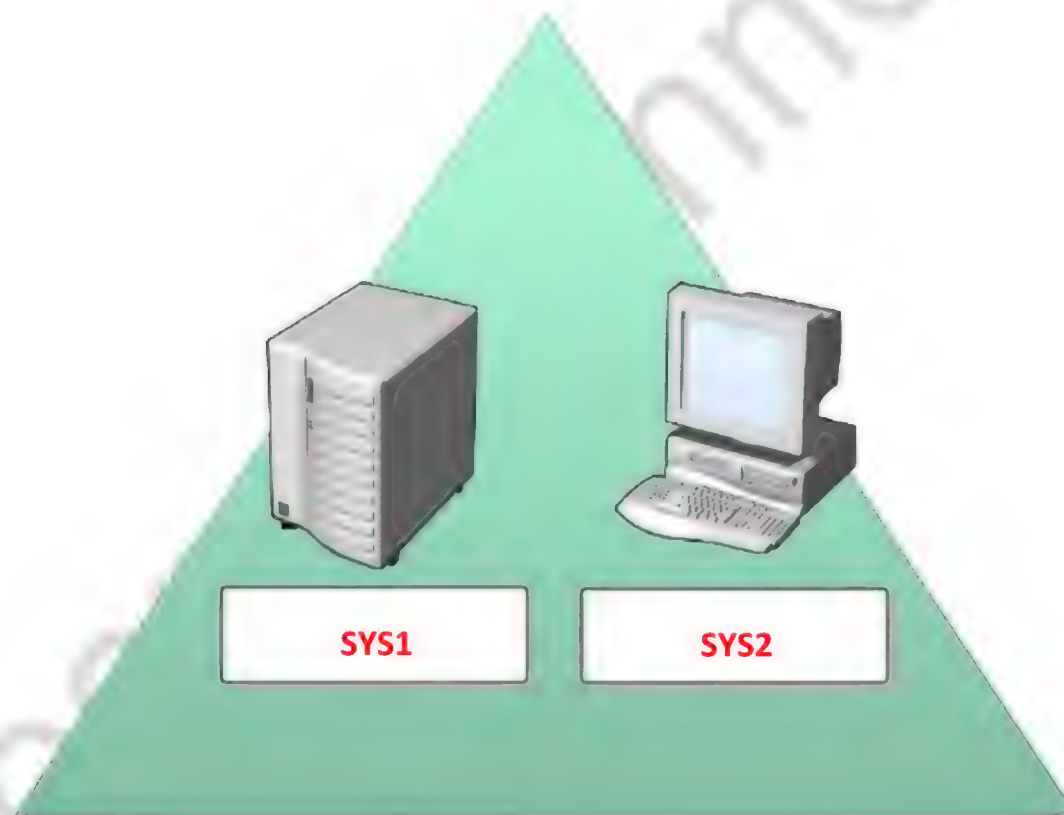
To view and clear the DNS cache

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller / DNS Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### Member Server / DNS Server

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.2

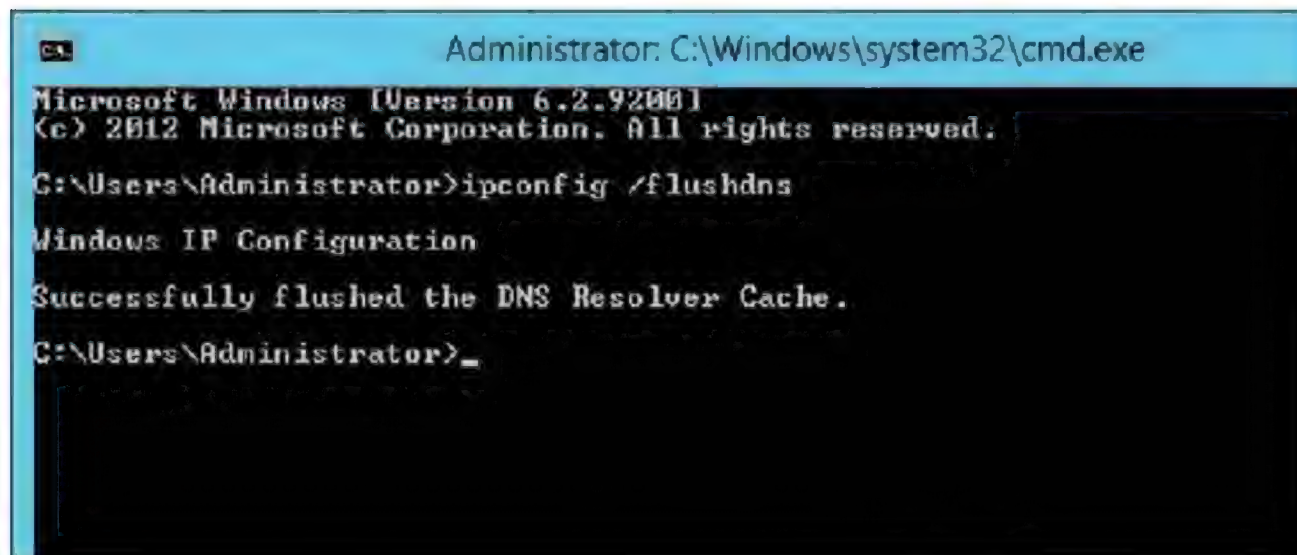
**Steps:**

1. To see the information present in the cache type the command

**"Ipconfig /displaydns"**

2. To clear the cache information type the command

**"Ipconfig /flushdns"**



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.
C:\Users\Administrator>ipconfig /flushdns
Windows IP Configuration
Successfully flushed the DNS Resolver Cache.
C:\Users\Administrator>
```



## Lab – 58: Installing and Configuring Internet Information Services

### Objective:

To create a website and host it using IIS

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller/DNS/Web Server

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

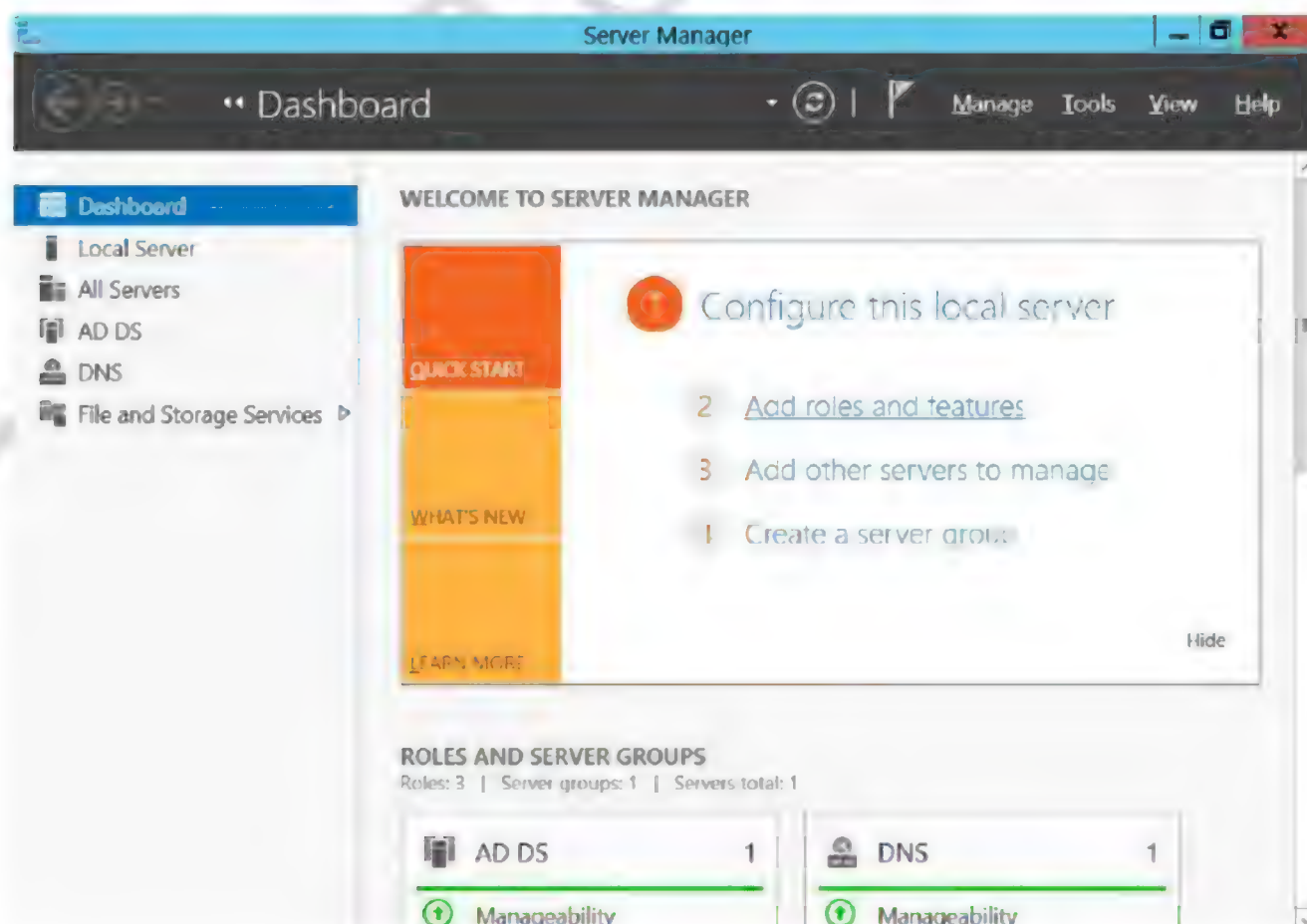
## Installing Internet Information Services - Web & FTP Server

### SYS1- CONFIGURATION

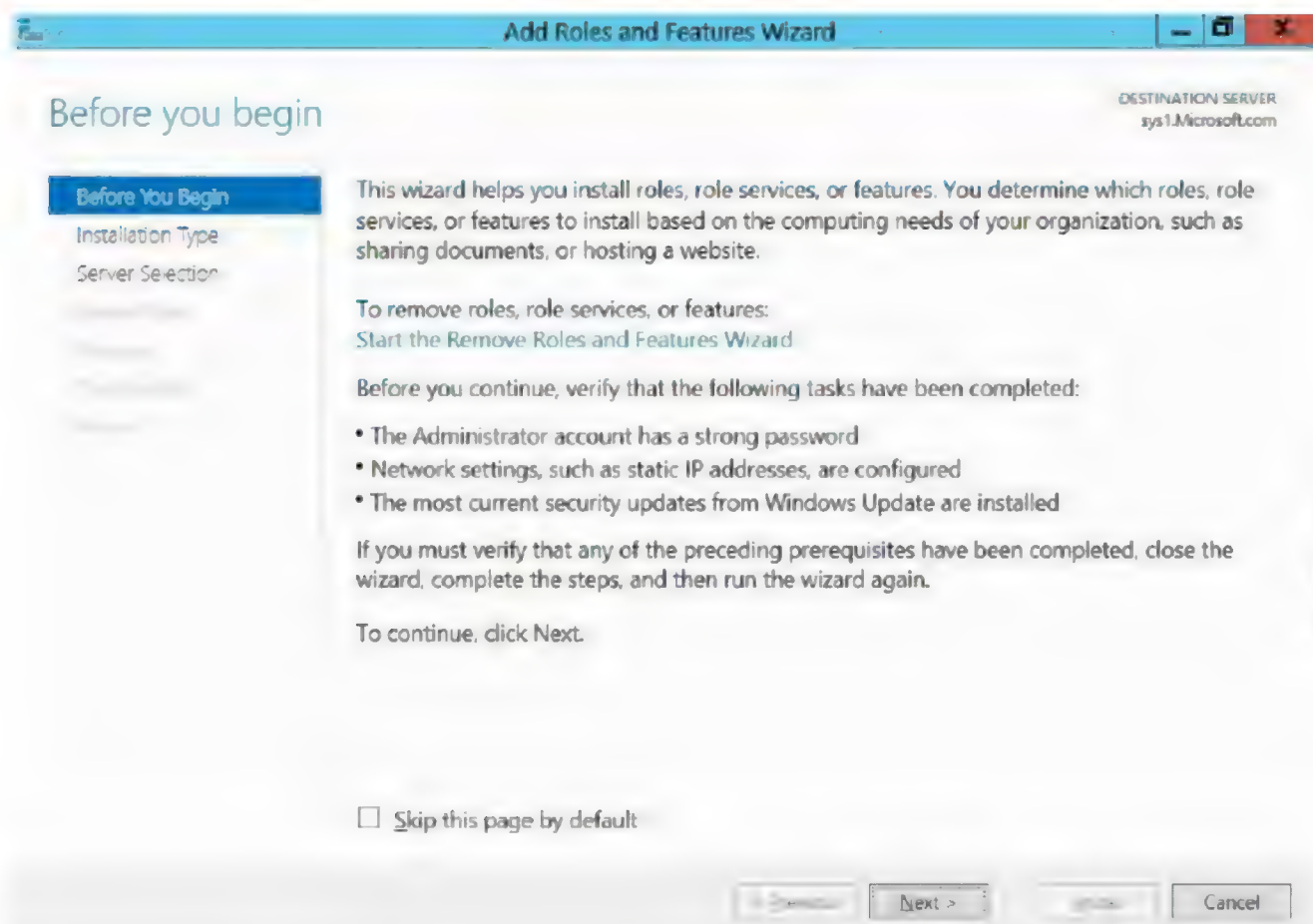
1. Click **Server Manager**.



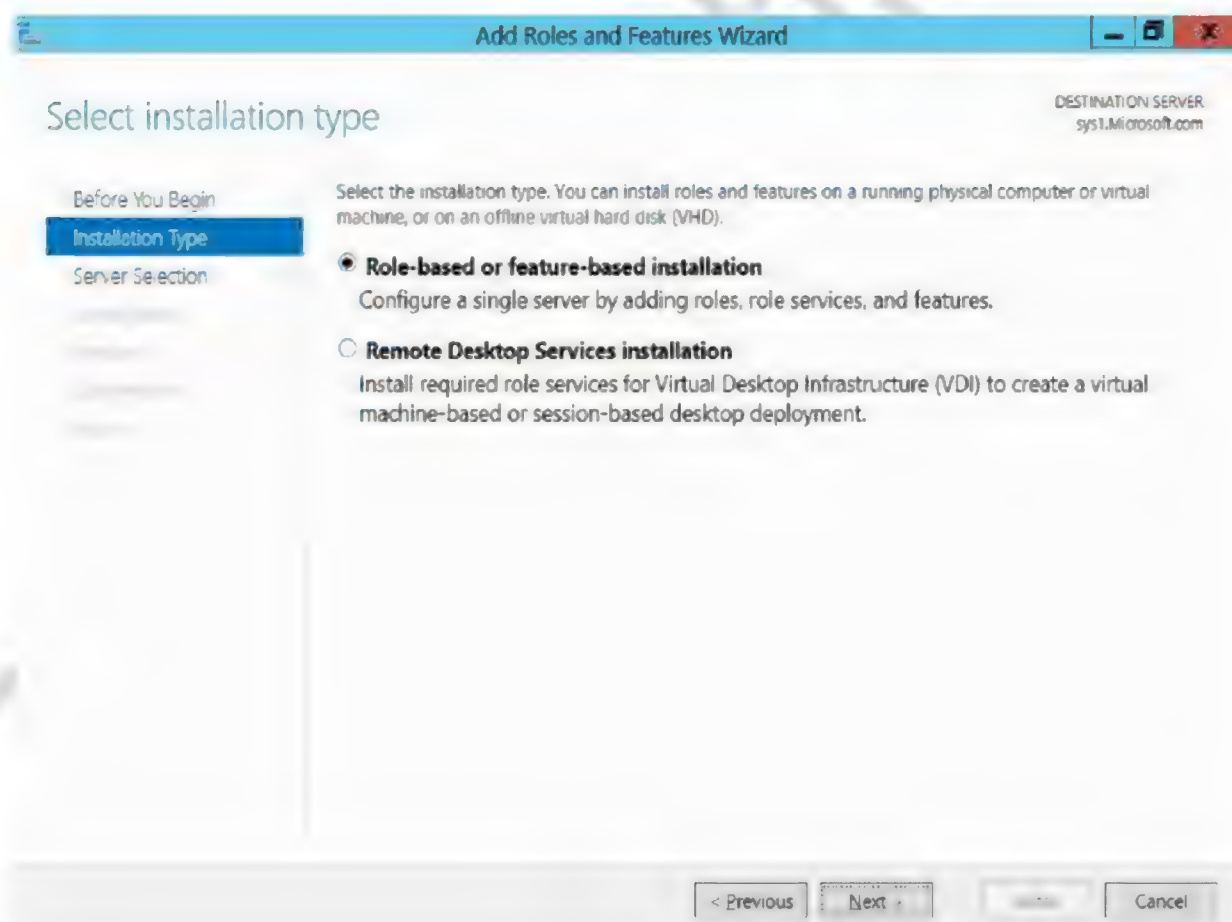
2. In the Server Manager Dashboard → select **Add roles and features**.



3. In Before you begin page, click **Next**.

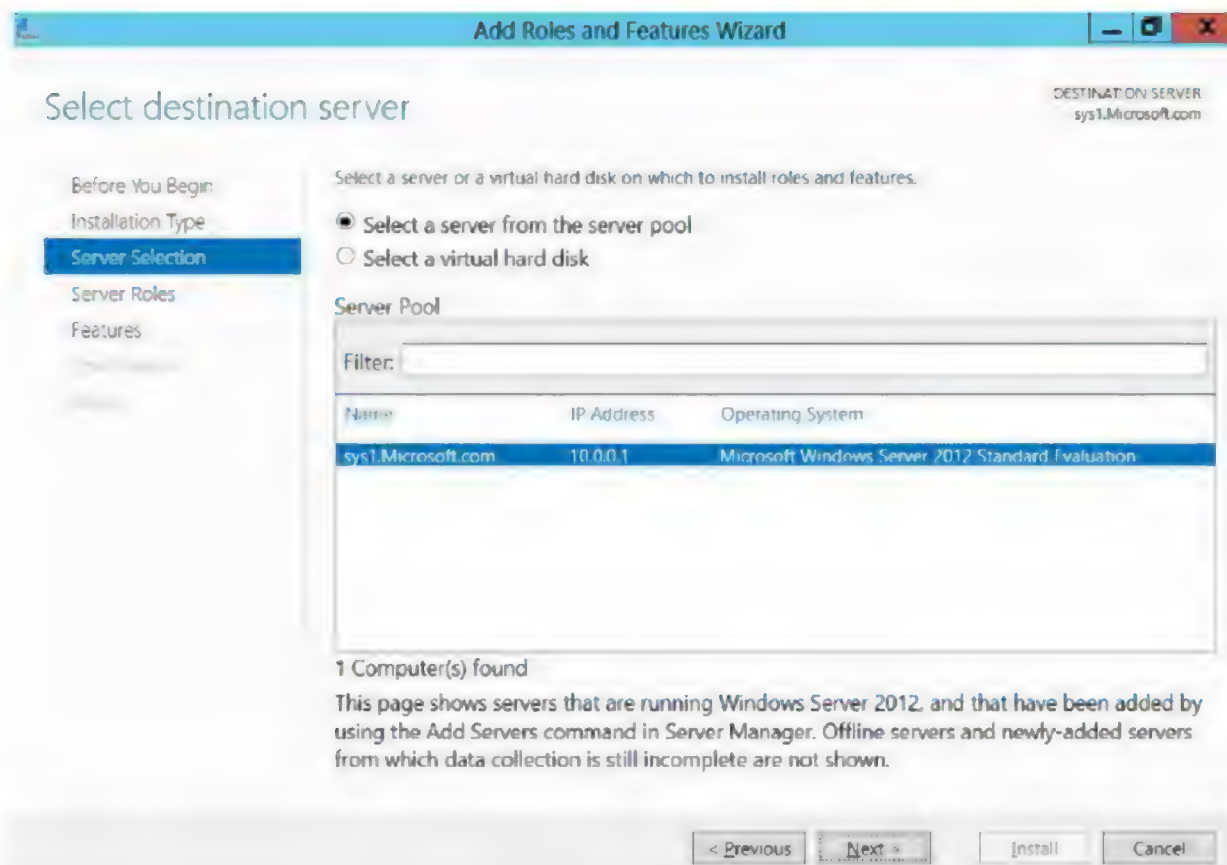


4. Select **Role-based or feature-based installation**, click **Next**.

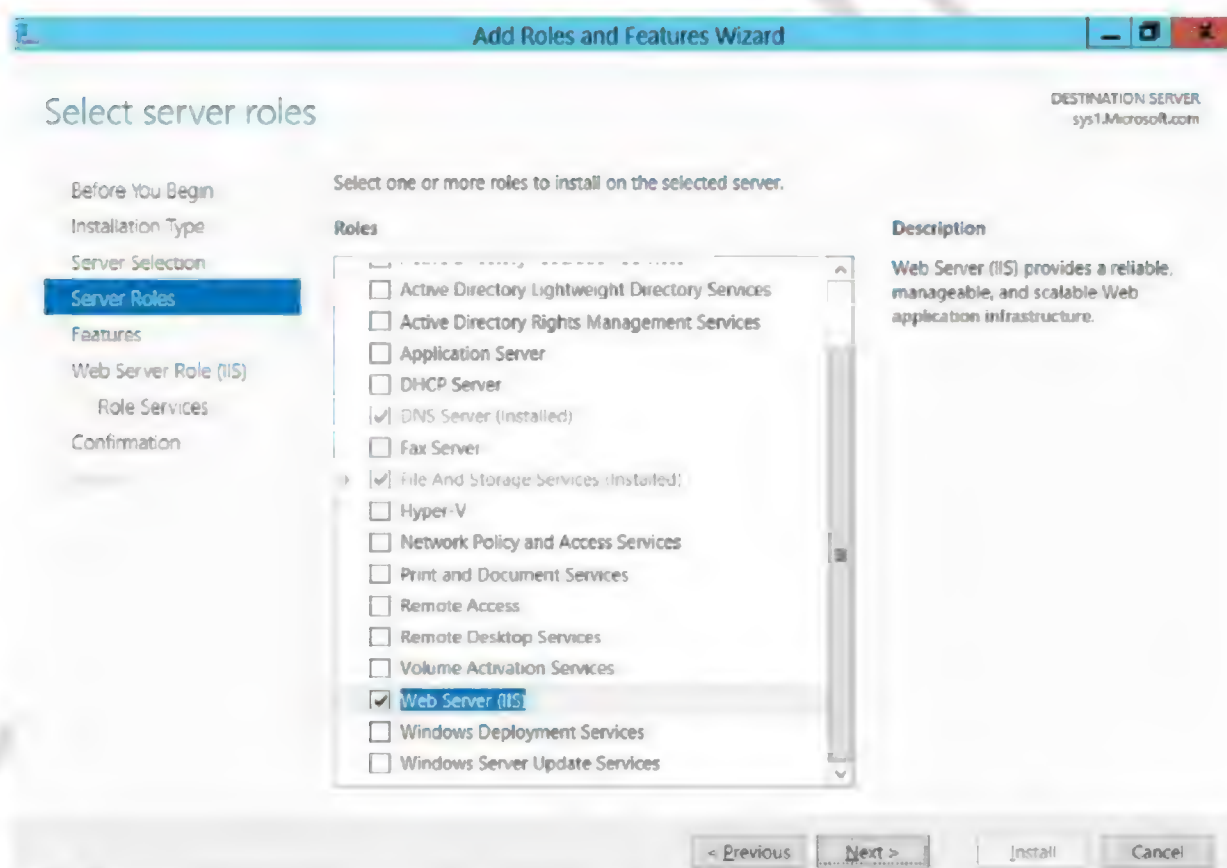




- Select a server (**sys1.Microsoft.com**) from the server pool and click **Next**.

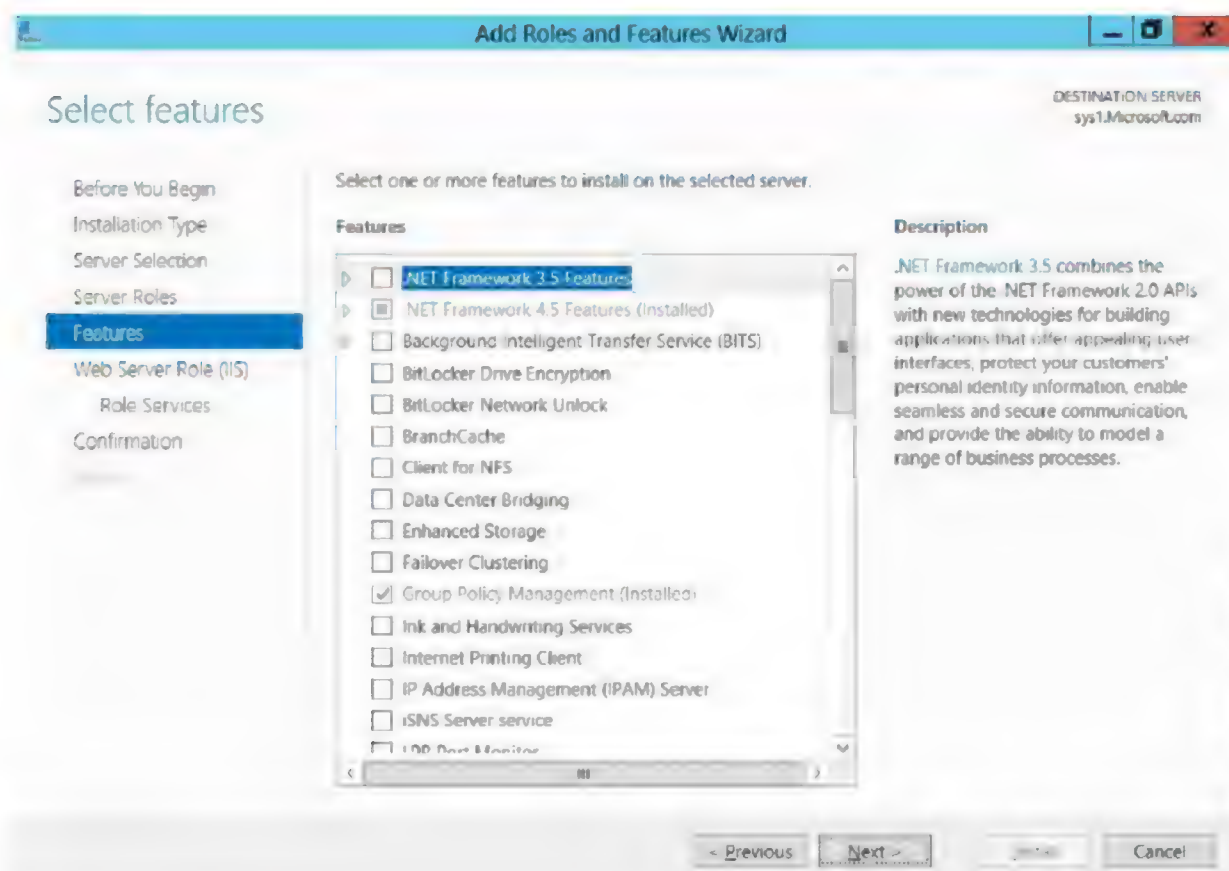


- In select server roles, check the box Web Server and click **Next**.

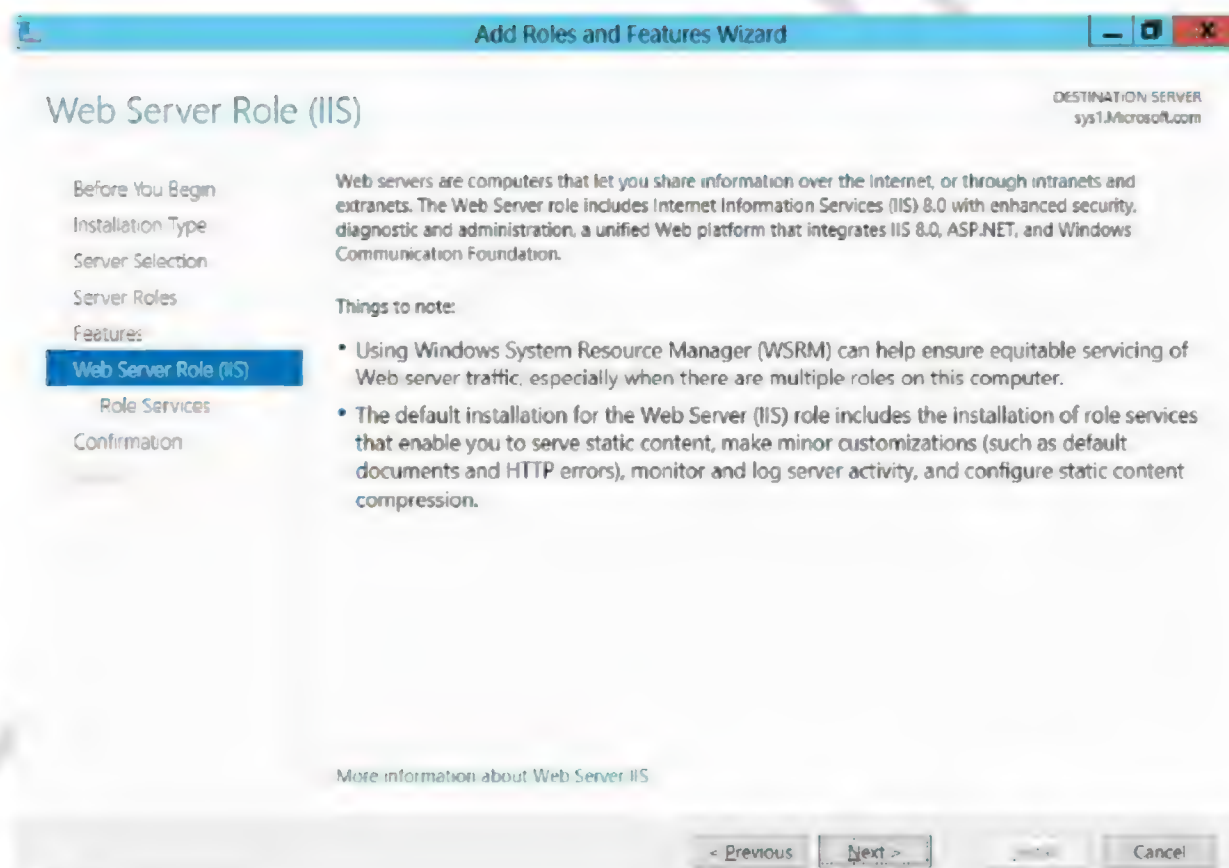


- In Add required features for Web Server (IIS), click **Add Features**.

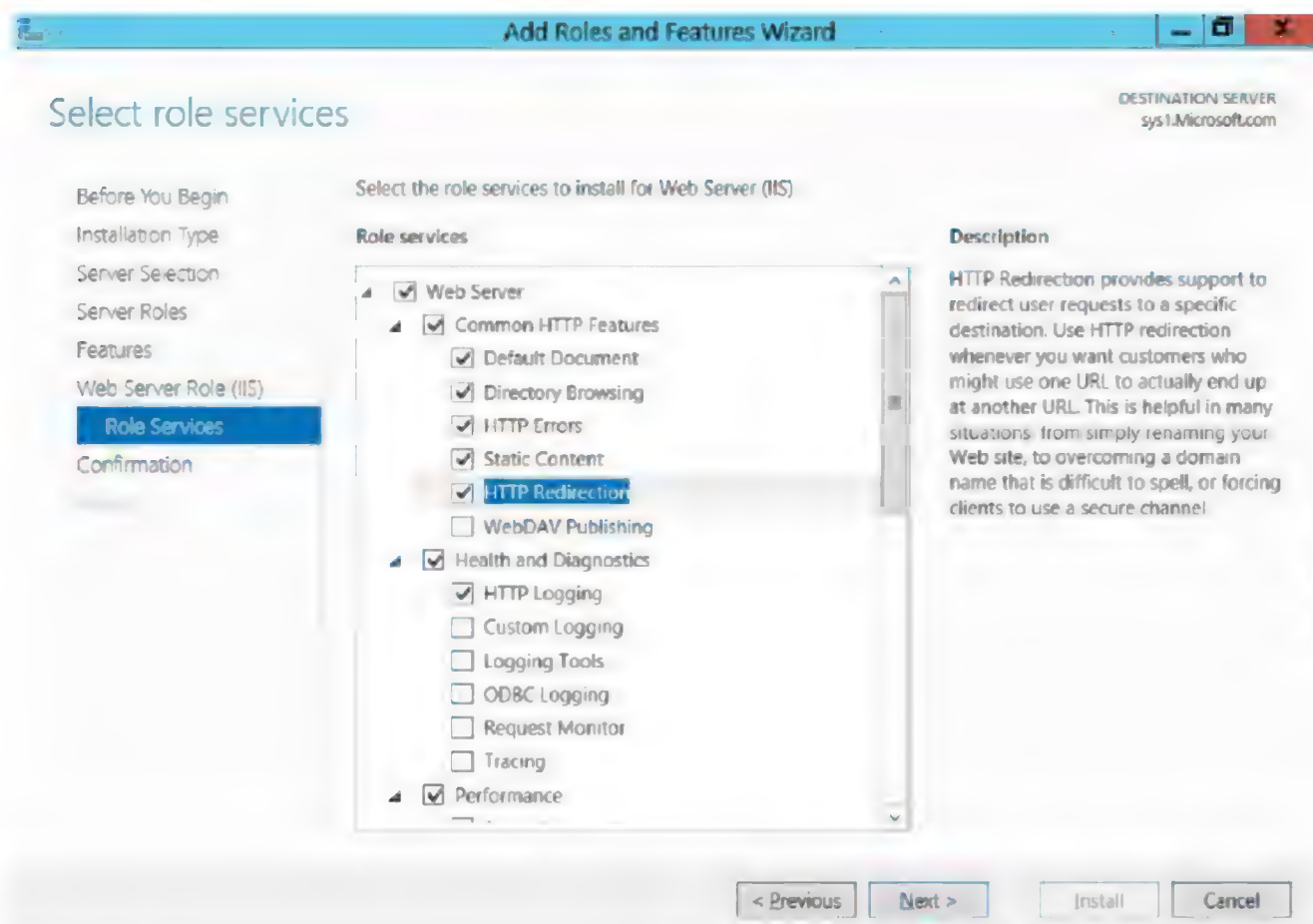
8. In select features, click **Next**.



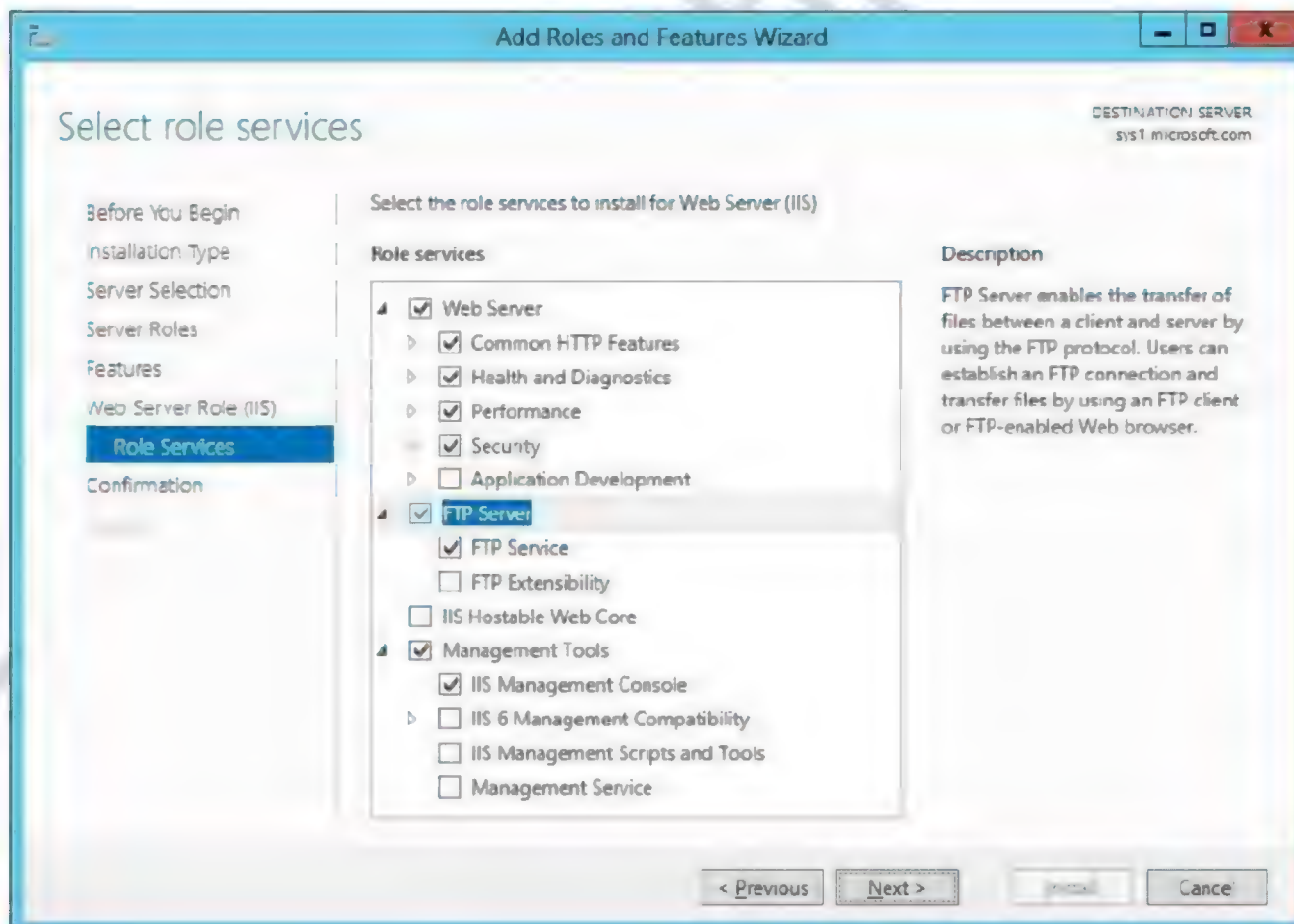
9. Click **Next**.



10. Check the box **HTTP Redirection**, under Common HTTP Features.

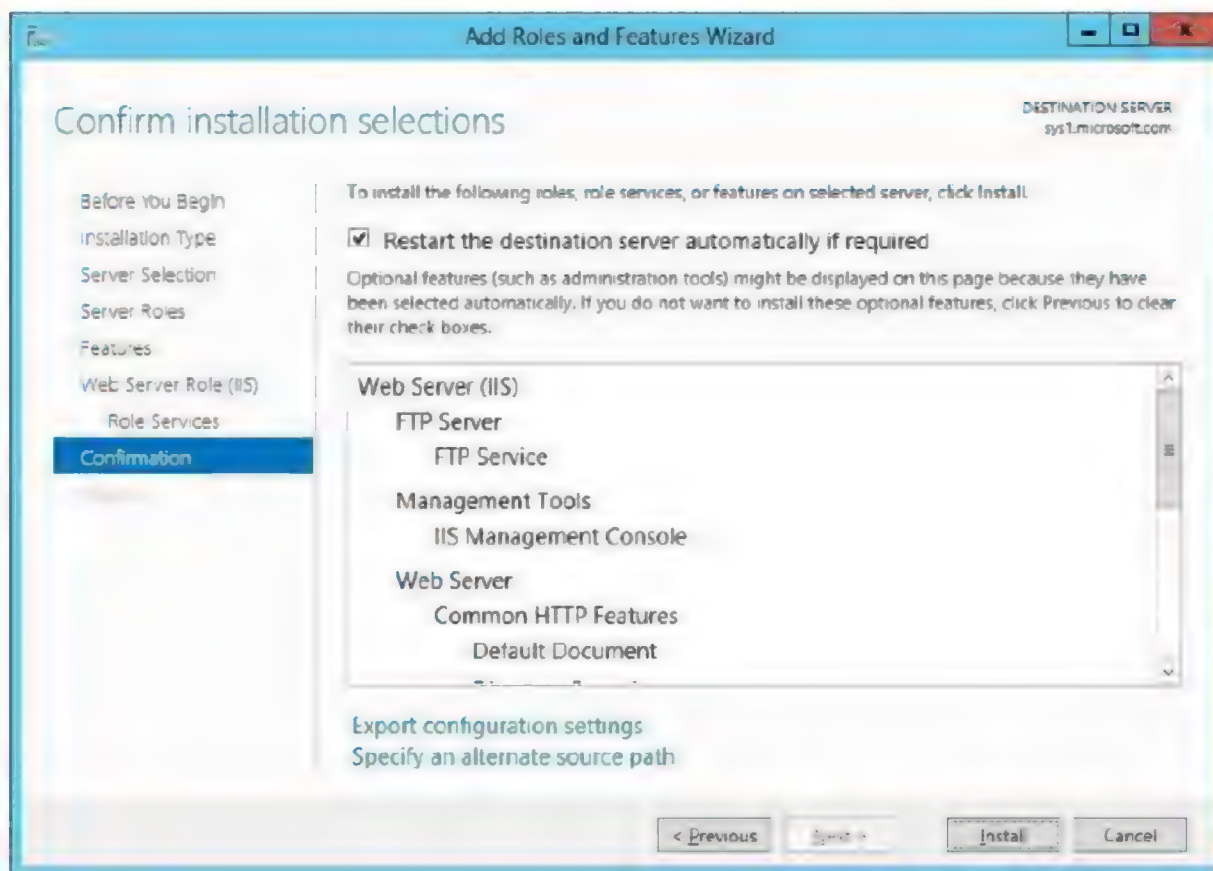


11. Check the box **FTP Service**, under FTP Server.

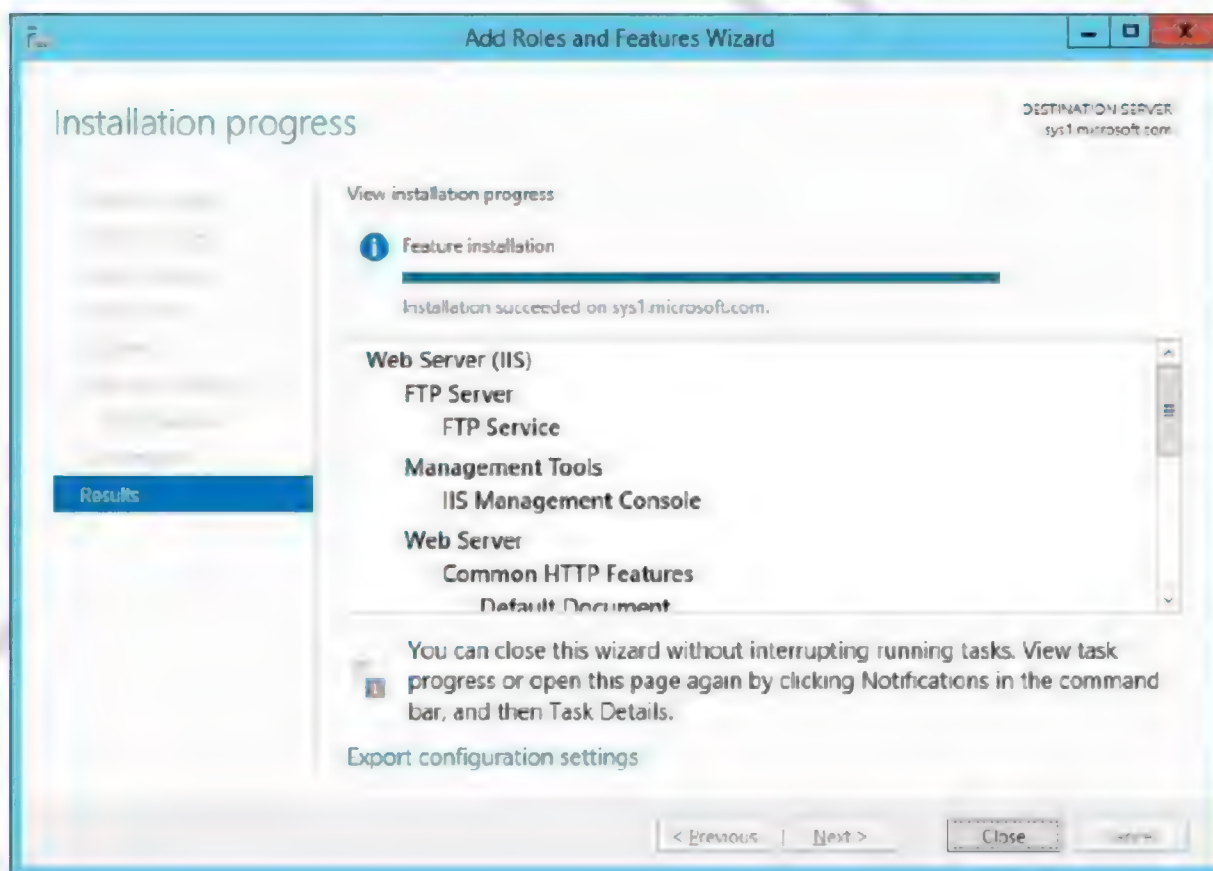




12. Check Restart the destination server automatically if required and click **Install**.



13. Select **Complete DHCP configuration**.

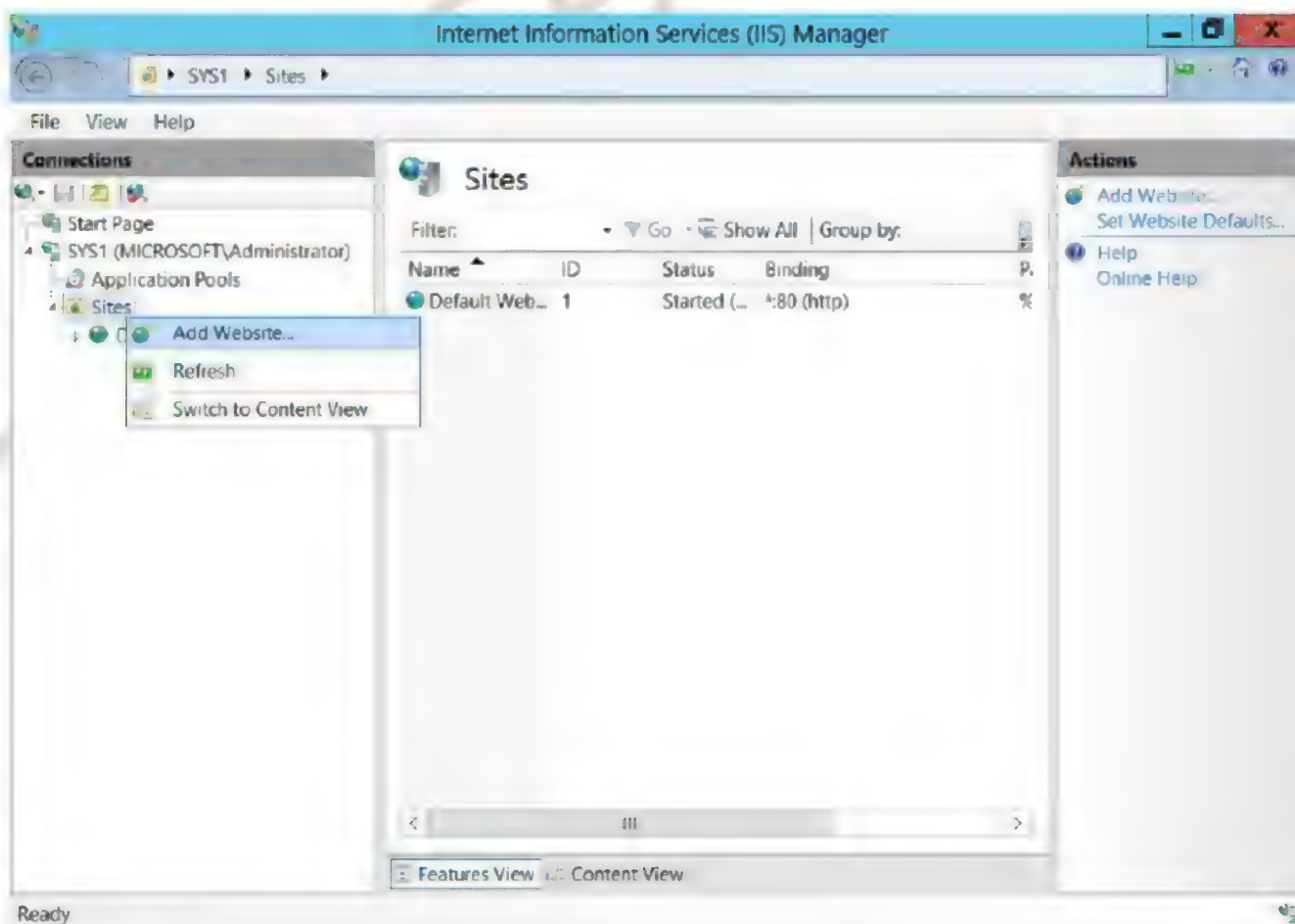


## Creating a Web Site

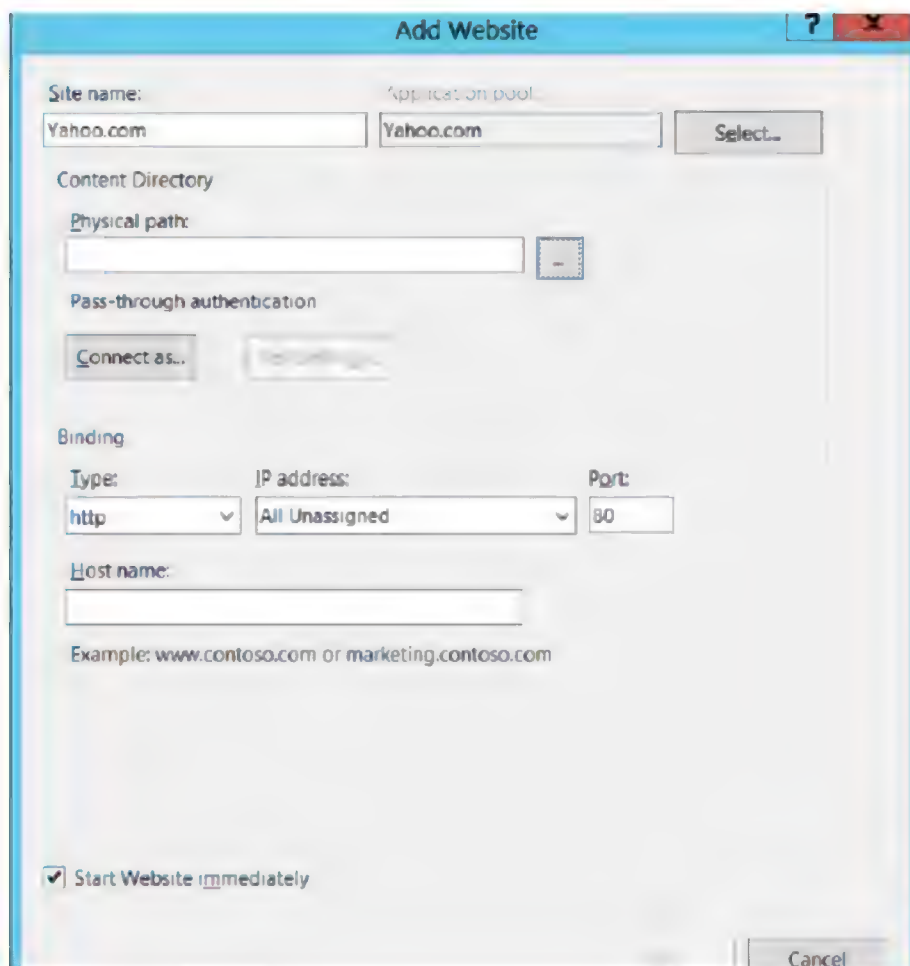
1. Go to Start, select **Internet Information Services Manager**.



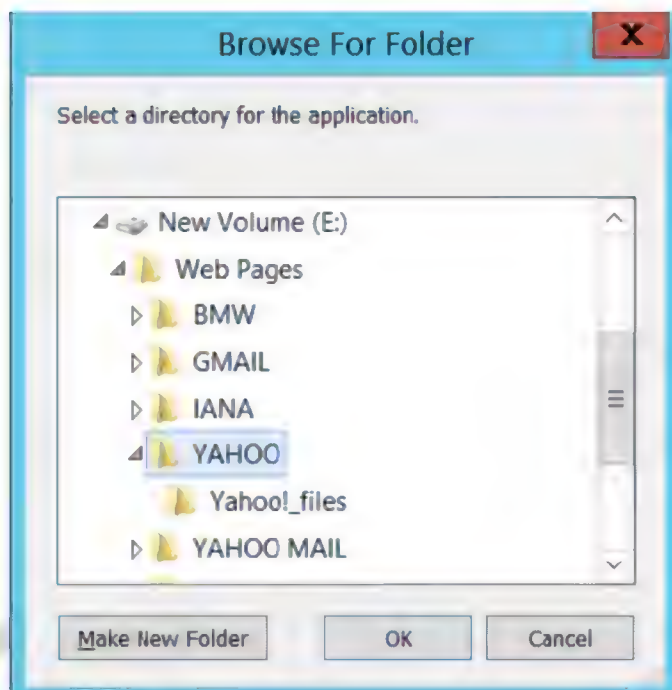
2. In the left pane of the **Internet Information Services**, Expand the server → Right click on sites and select **Add Web Site**.



3. **Add Web Site** wizard opens → In the Site name type a **Name for the Website** Ex:YAHOO.COM



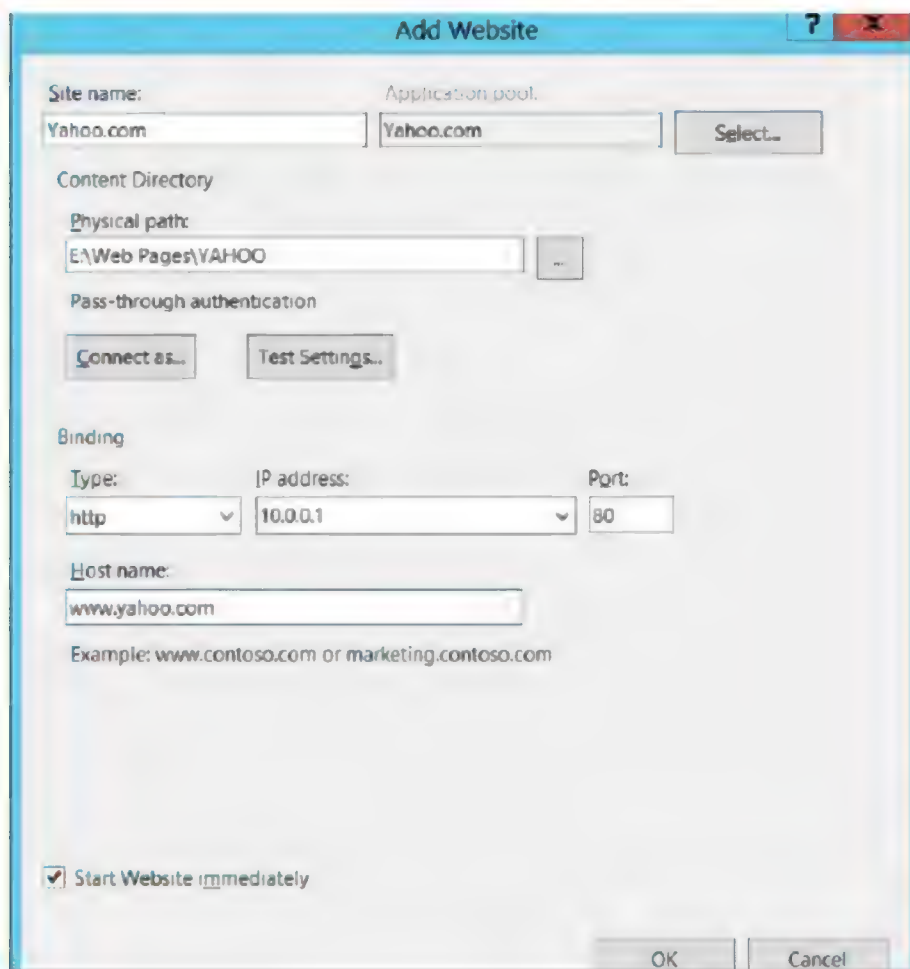
4. In Physical path, browse and select the location of **Home Directory (webpage)**



5. Select one **IP address (10.0.0.1)** from the drop-down list.



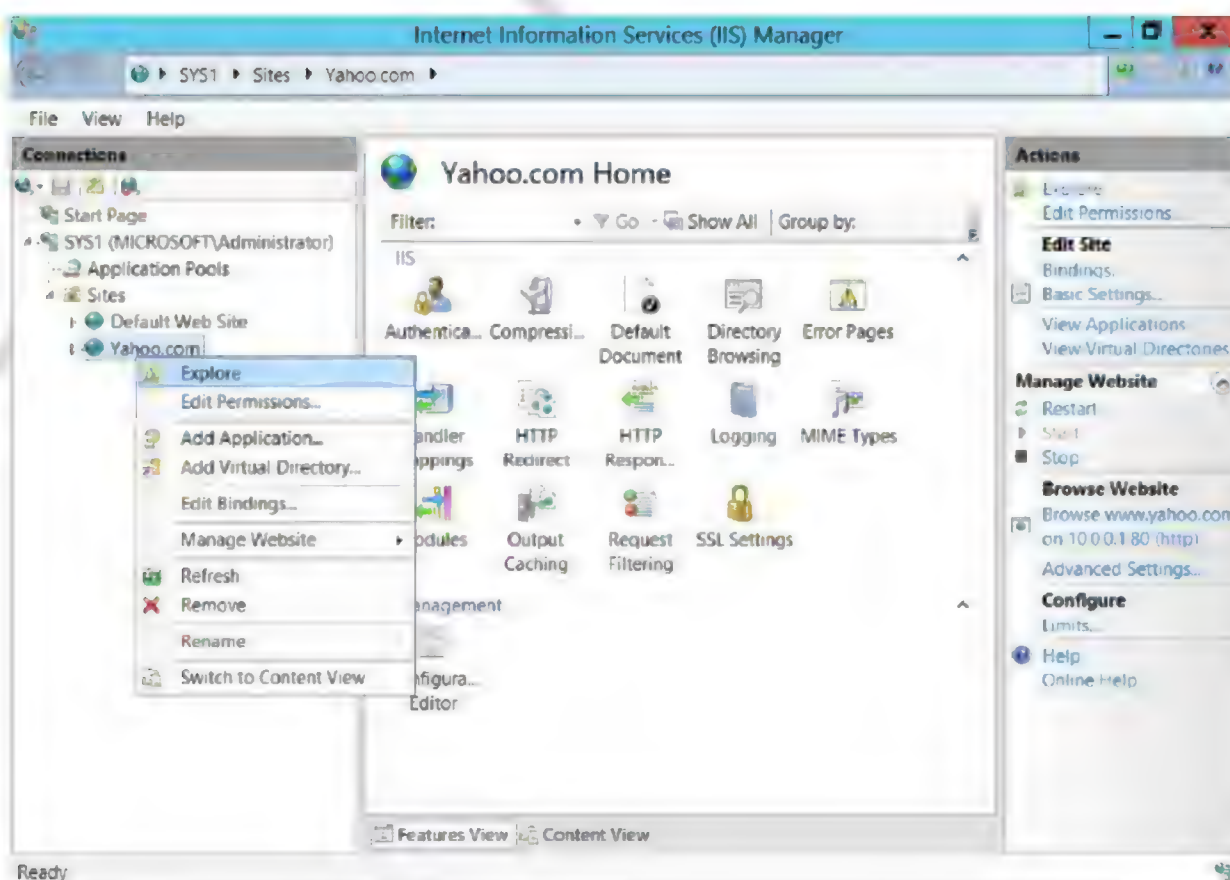
- Specify the Host name Ex: [WWW.YAHOO.COM](http://WWW.YAHOO.COM) & click **OK**.



- Web Site** will be successfully added.

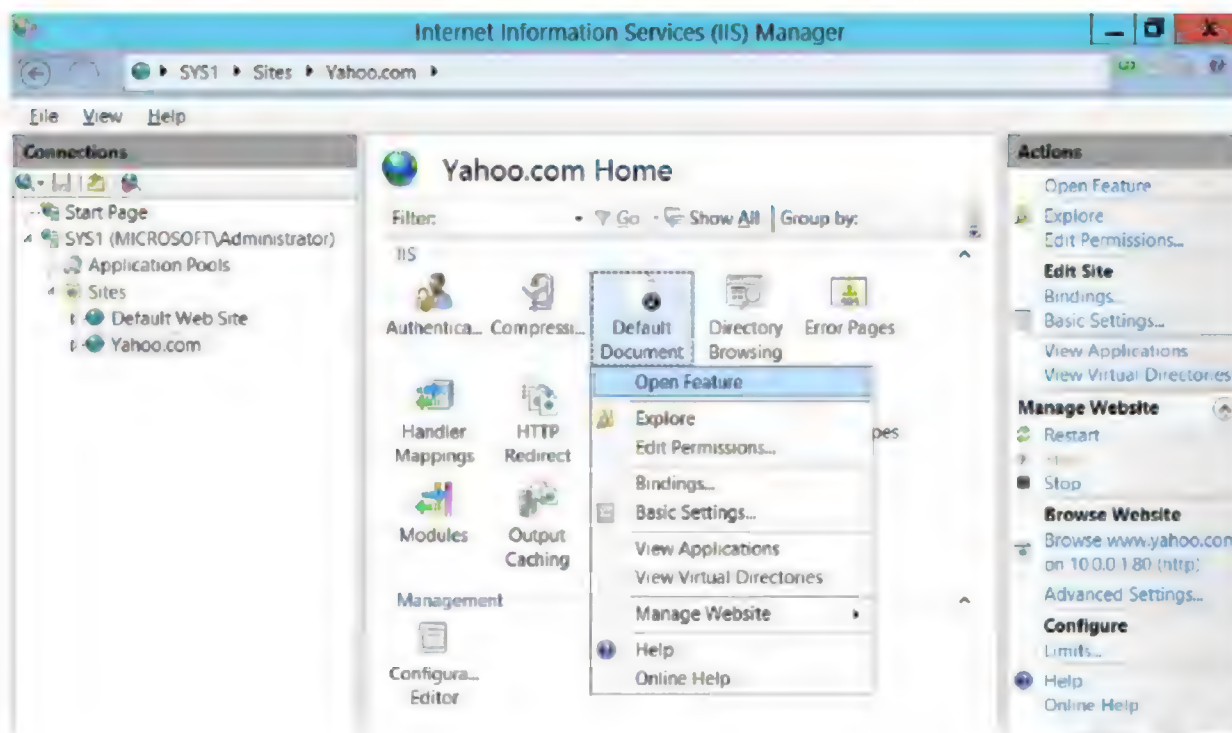
## Adding the Default Document for the website

- Open IIS → expand sites → select website → right click and select **Explore**.



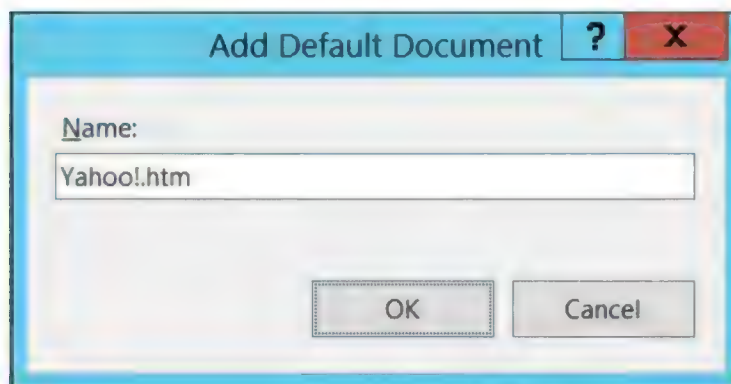
- Select the **Webpage** → Right click & select **Rename** → Copy the webpage name

3. In IIS → expand sites → select website → Open **Default Document** feature.



4. Click **Add**, Mention (Paste) the html file name (with Extension of file)

Ex: Yahoo!.htm → click **OK**.



## Enable Directory Browsing for the web site

1. Open IIS → expand sites and select the website (YAHOO.COM)

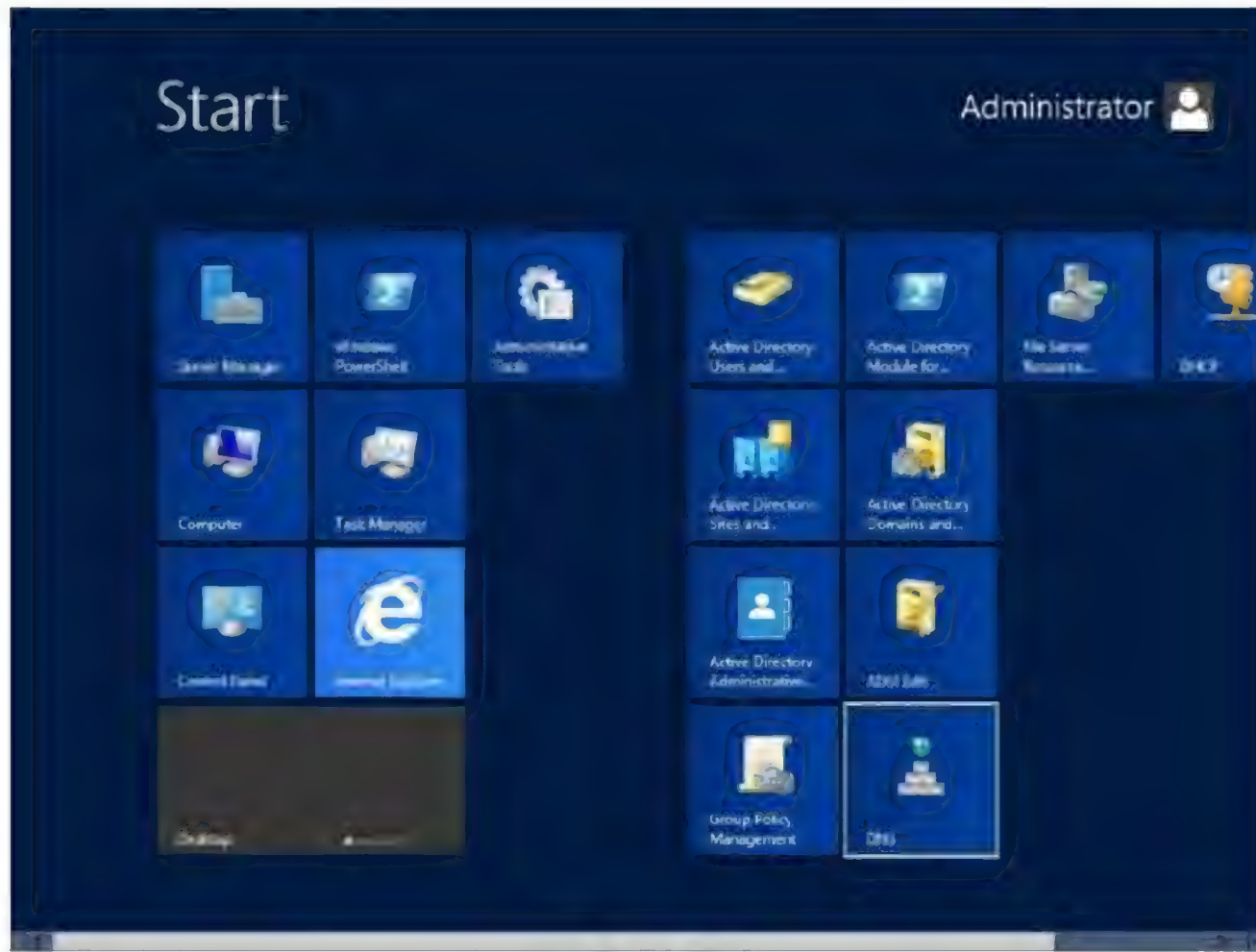


2. Open **Directory Browsing Feature** → click **Enable**. (on Actions pane)

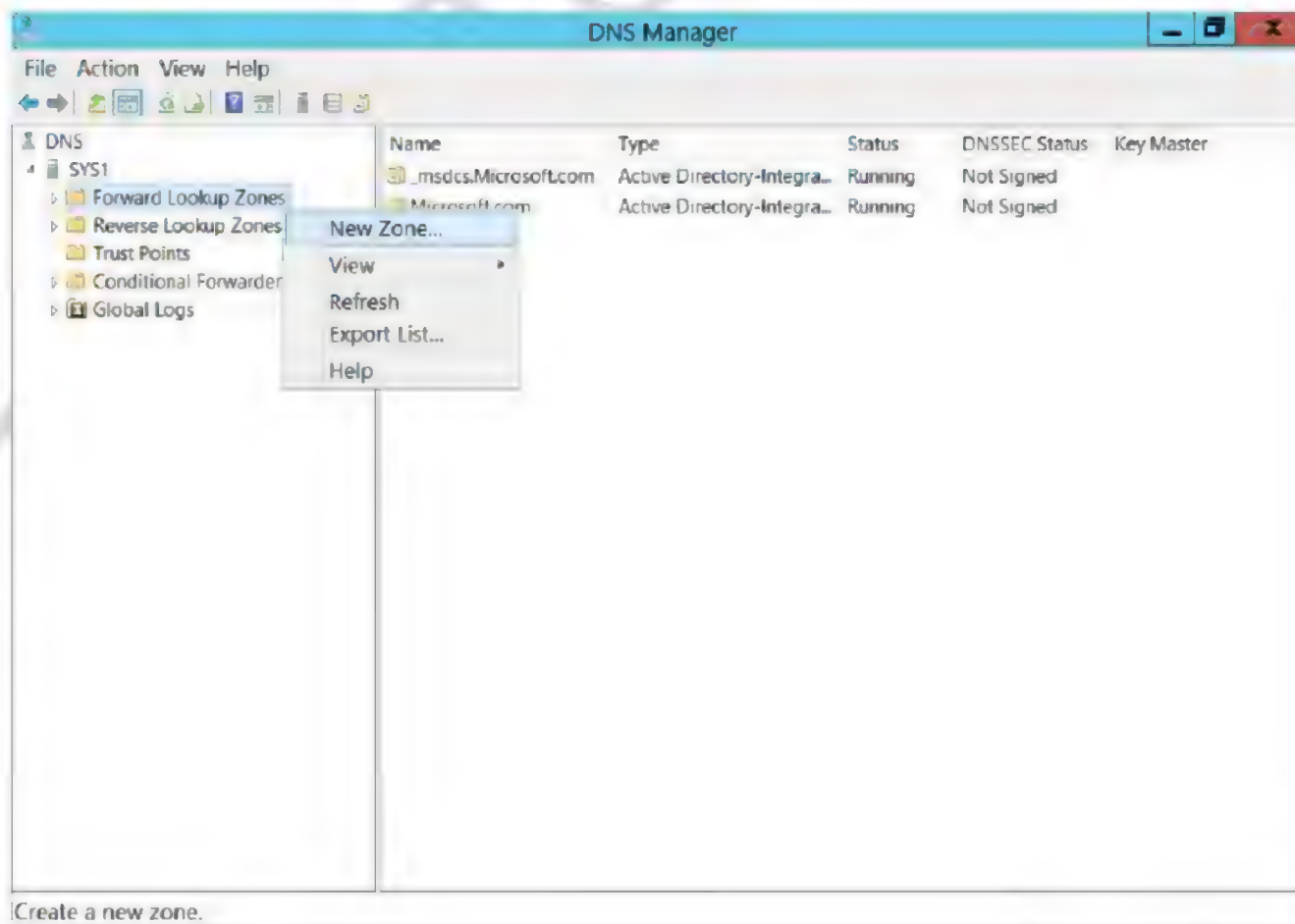


## DNS Configuration for the Website

1. Go to Start, select DNS



2. Select **Forward Lookup Zone** → Right click select **New Zone**

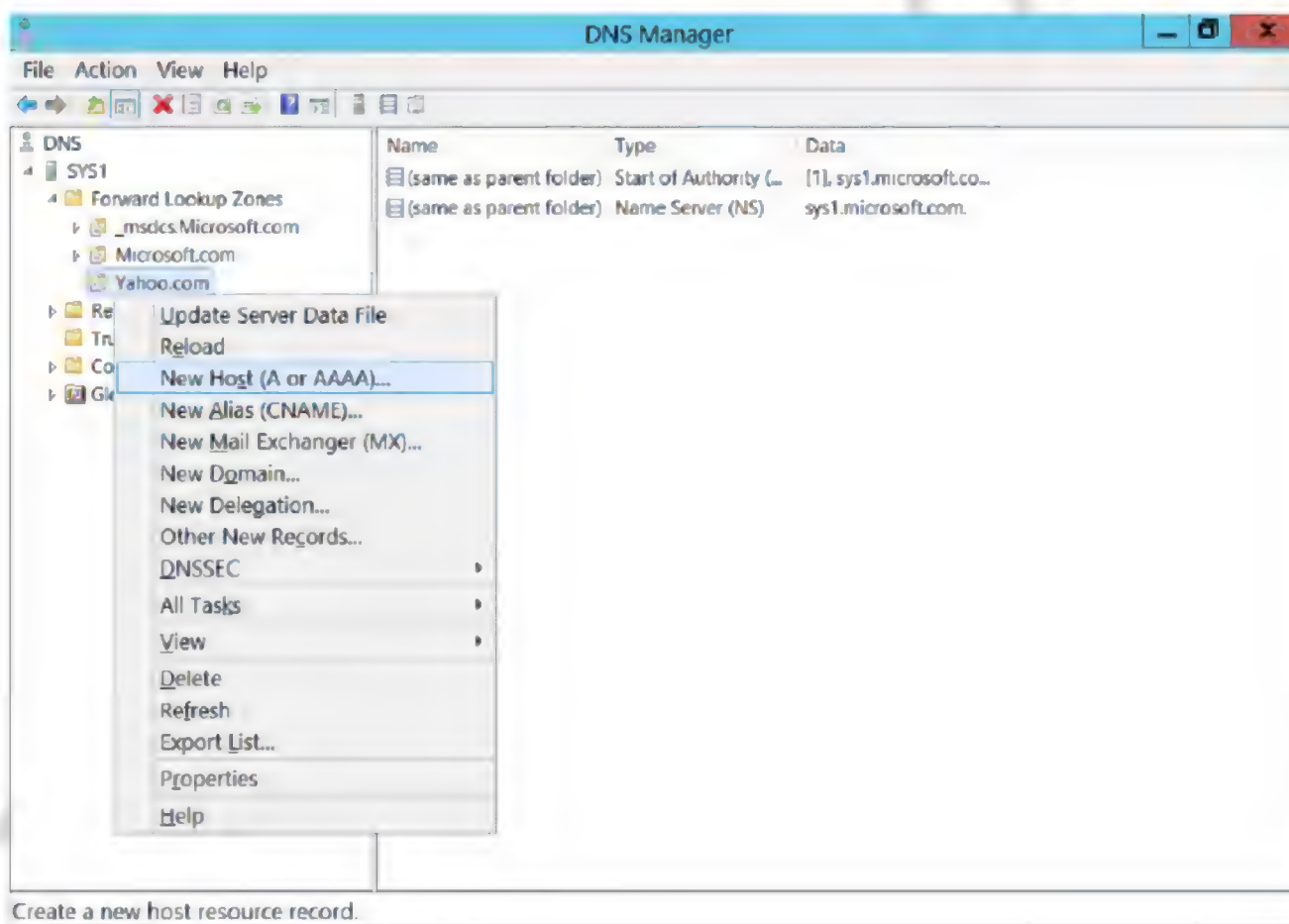




3. Create a new primary zone in **Forward Lookup Zone** and mention the website **Domain Name** (Ex:YAHOO.COM)



4. Select the zone → Right click select **New Host**



5. Mention the **Web Server name and IP Address** → **Add Host** → **OK** → **Done**.

**New Host**

Name (uses parent domain name if blank):  
SYS1

Fully qualified domain name (FQDN):  
SYS1.Yahoo.com.

IP address:  
10.0.0.1

☐ Create associated pointer (PTR) record

Add Host Cancel

6. Select the zone → Right click select **New Alias** & Create an **Alias** (E.g: www) for the host, which you specified in the host header for the site → click **OK**.

**New Resource Record**

Alias (CNAME)

Alias name (uses parent domain if left blank):  
www

Fully qualified domain name (FQDN):  
www.Yahoo.com.

Fully qualified domain name (FQDN) for target host:  
SYS1.Yahoo.com Browse...

OK Cancel

**Verification:**

1. Open **Internet Explorer** or any browser and access the **website**





## Lab – 59: Configuring redirection of Websites

### Objective:

To redirect requests from one website to another

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



**MICROSOFT.COM**

#### SYS1

##### Domain Controller/DNS/Web Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

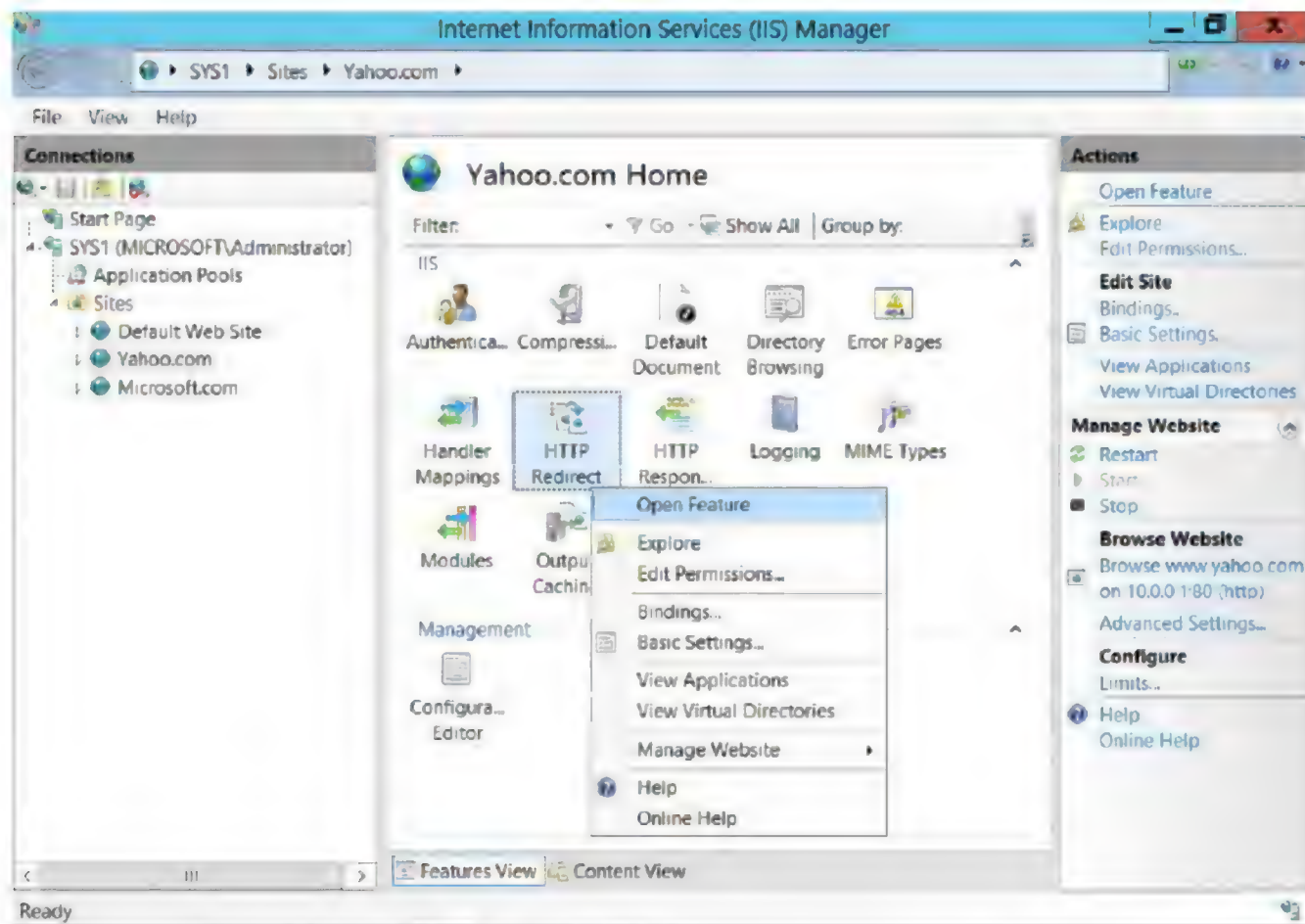
#### SYS2

##### Member Server / Client

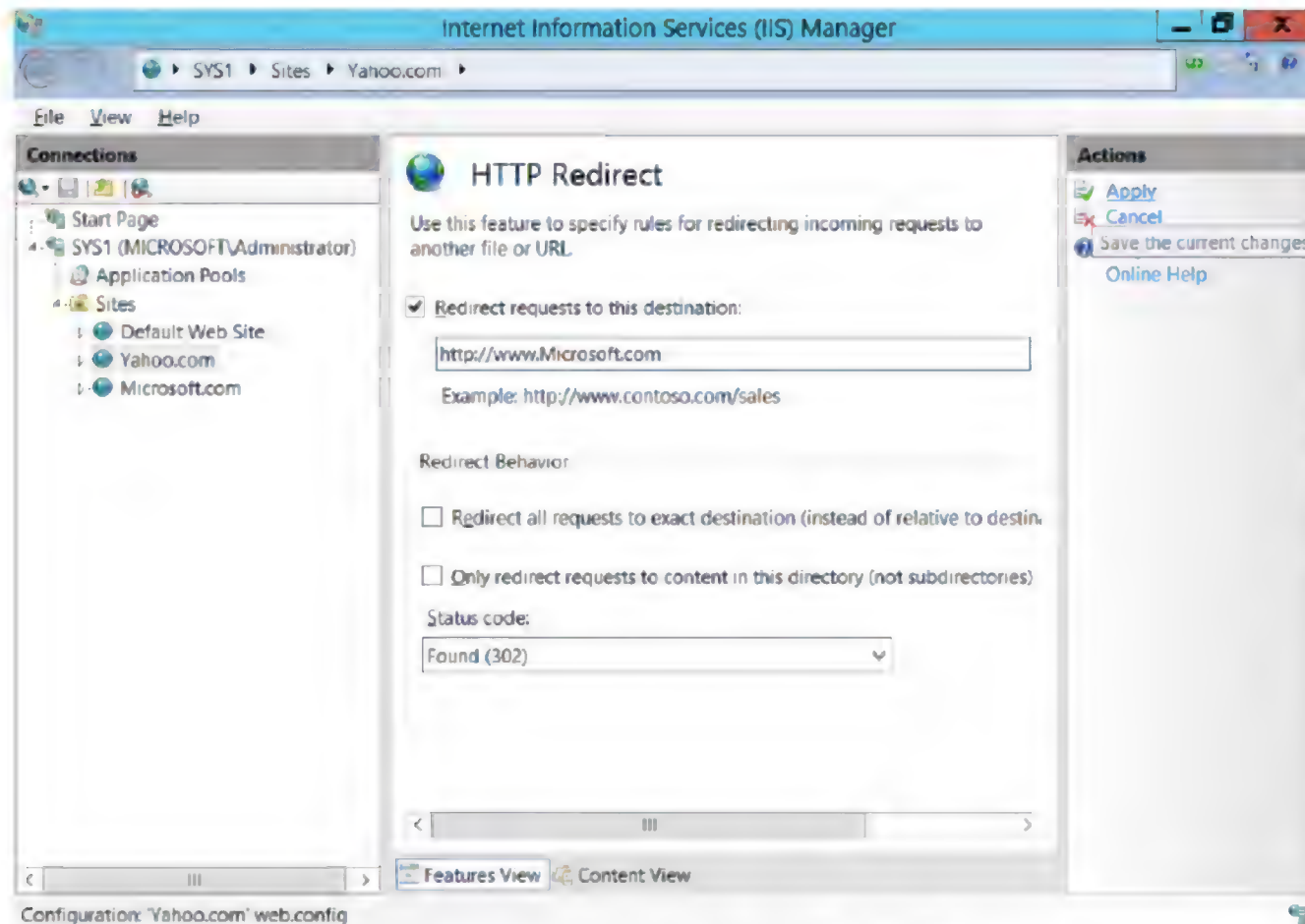
IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

**Steps:**

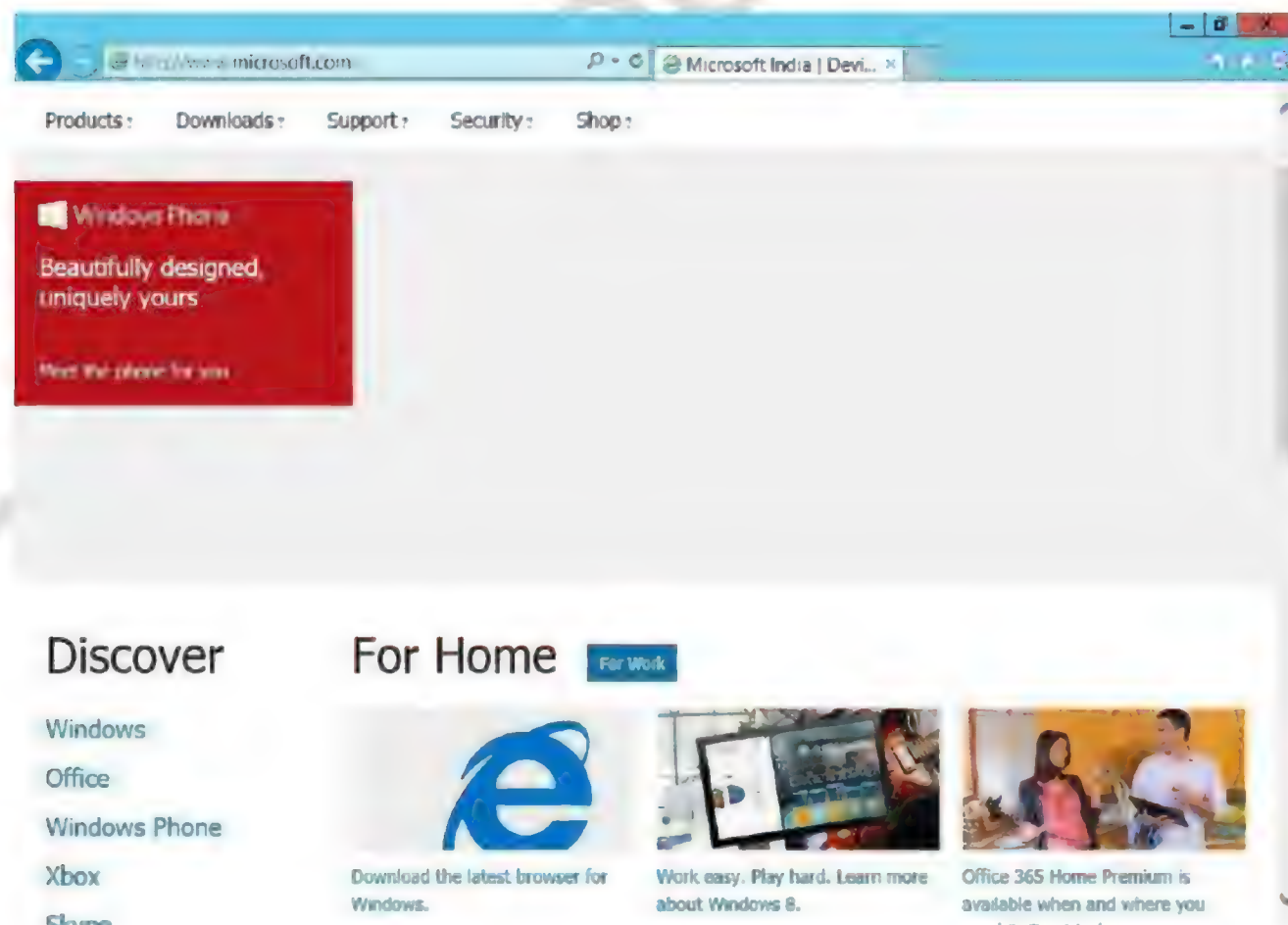
1. Go to Start select **Internet Information Services Manager**,
2. Create **two websites**, Ex:**YAHOO.COM** and **MICROSOFT.COM**
3. If YAHOO has to be redirected to MICROSOFT then Select **YAHOO.COM** → Open **HTTP Redirect** feature



- Select the check box **Redirect requests to this destination** give the destination as <http://www.MICROSOFT.com> and click **Apply** in the actions Pane.



- Open Internet Explorer or any browser and access Yahoo ([www.yahoo.com](http://www.yahoo.com)) and it will be automatically redirected to MICROSOFT ([www.MICROSOFT.com](http://www.MICROSOFT.com)).





## Lab – 60: Creating Virtual Directory

### Objective:

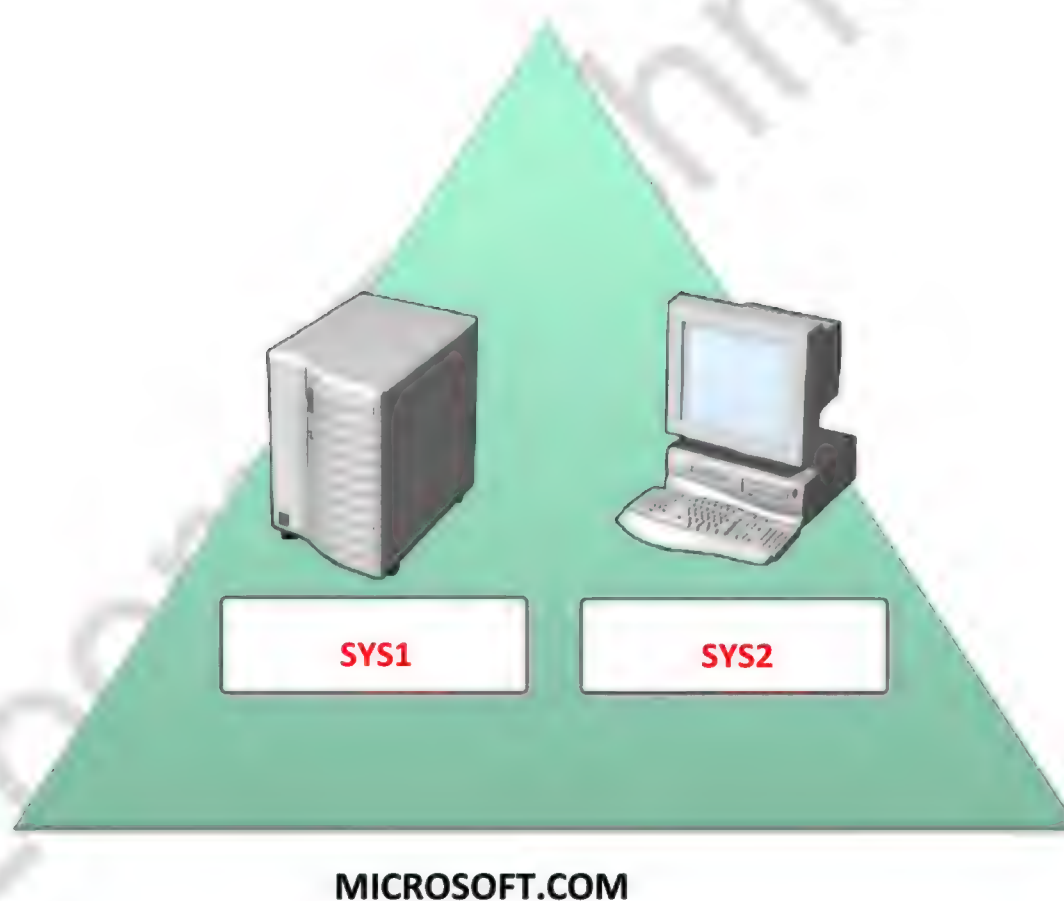
To configure webpage access via Virtual Directory

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



#### SYS1

##### Domain Controller/DNS/Web Server

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

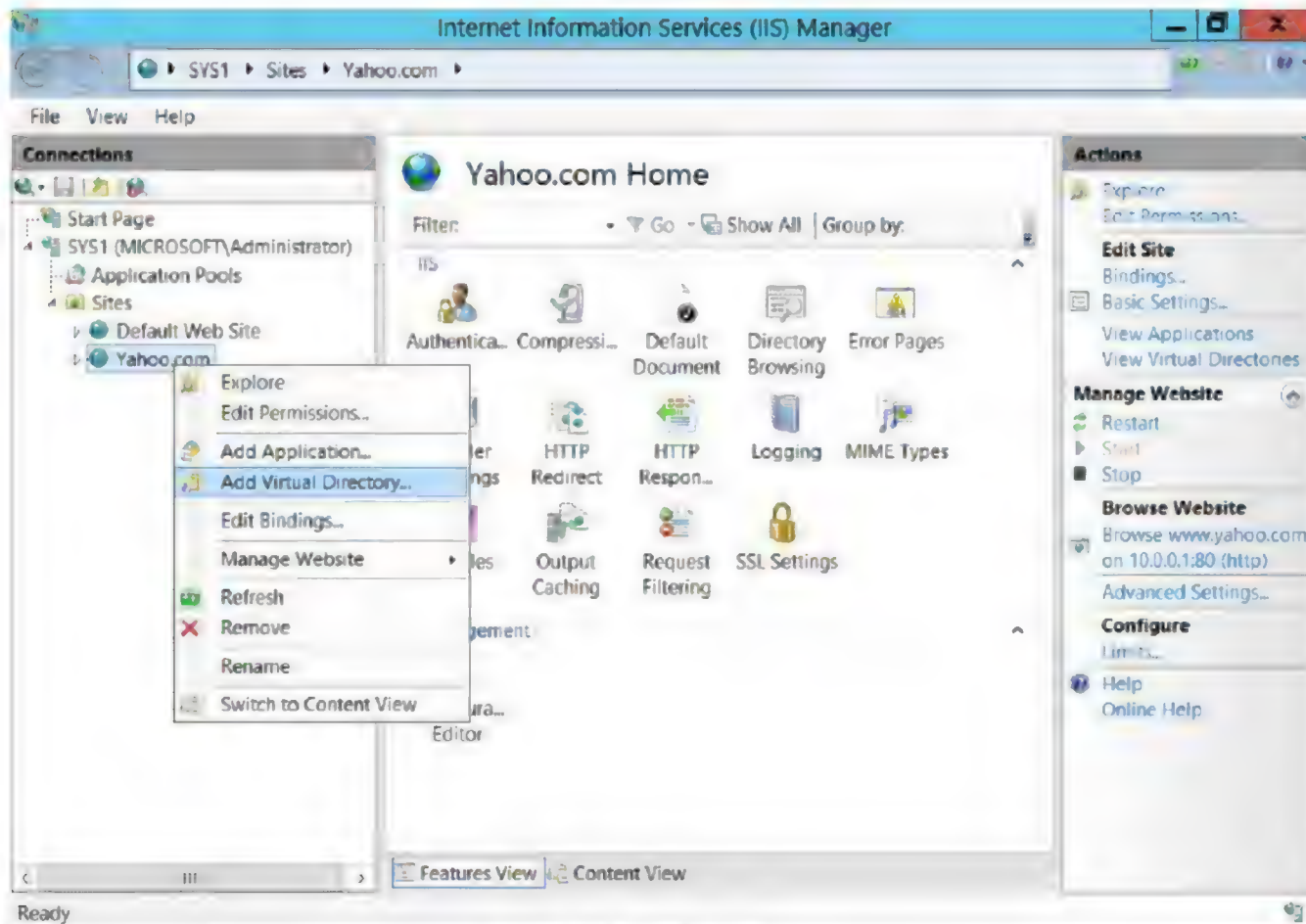
#### SYS2

##### Member Server / Client

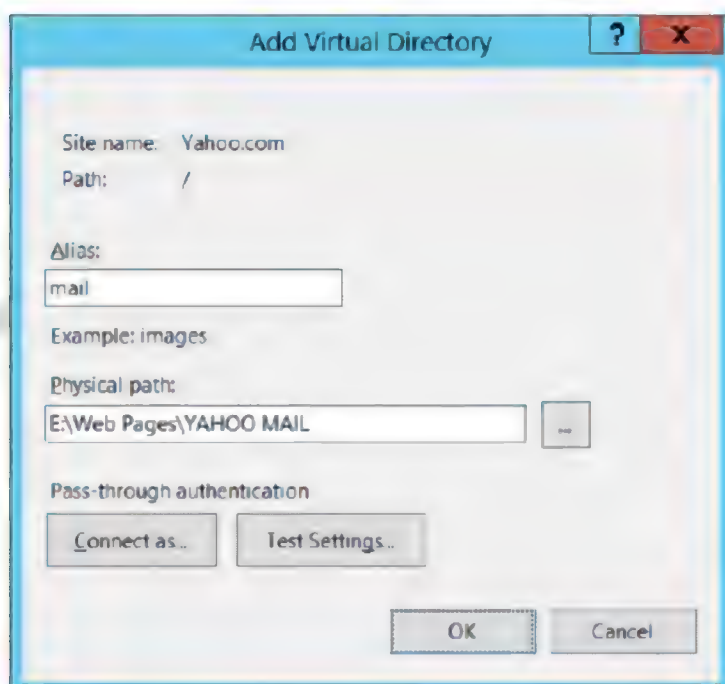
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

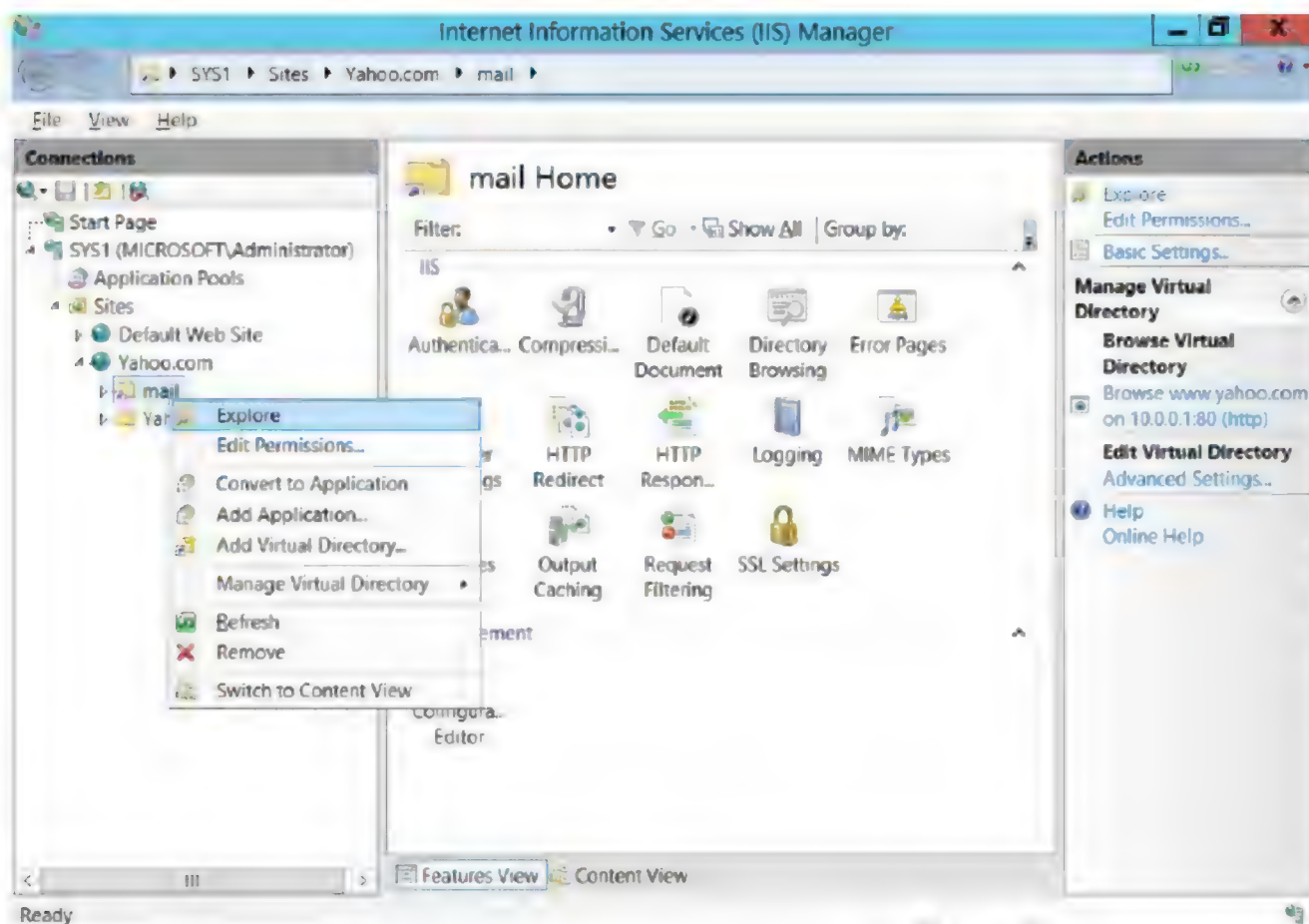
1. Go to Start, select **Internet Information Services Manager**.
2. Expand the system name, Select the Web Site (Yahoo) for which you want to create Virtual Directory → Right click and select **Add Virtual Directory**.



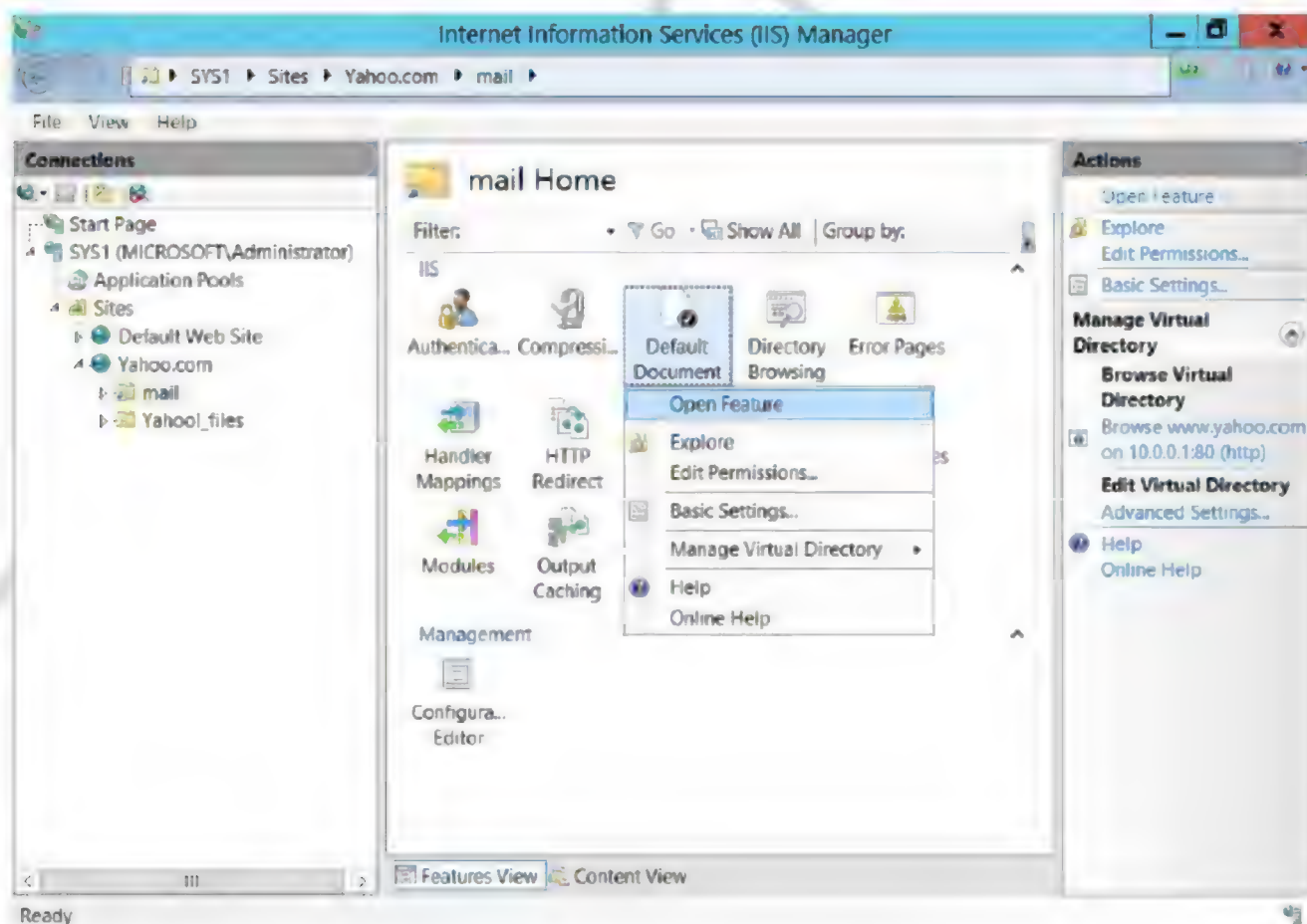
3. Specify the **Alias** name to the **Virtual Directory** (Ex: mail), and **Browse** to select the physical path Ex:(D:\Yahoo mail) → click **OK**.



4. Virtual Directory will be created.



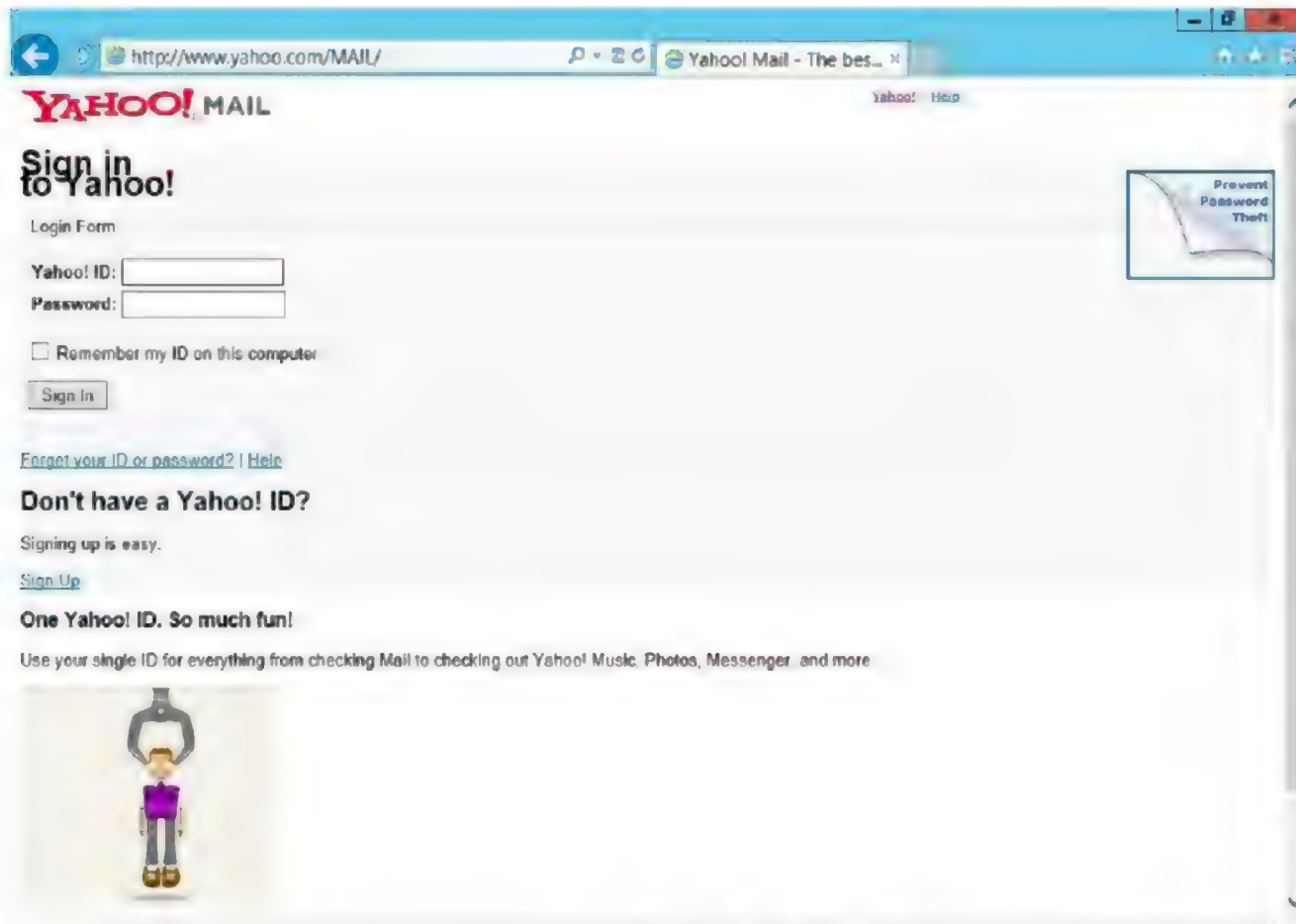
5. Add the **Default Document** for the **Virtual Directory** → OK





6. To access the virtual directory specify the syntax in Internet Explorer  
<http://website/virtualdirectoryname>

Ex: <http://www.Yahoo.com/mail>



## Lab – 61: Changing the Web Site IP address or Port number

### Objective:

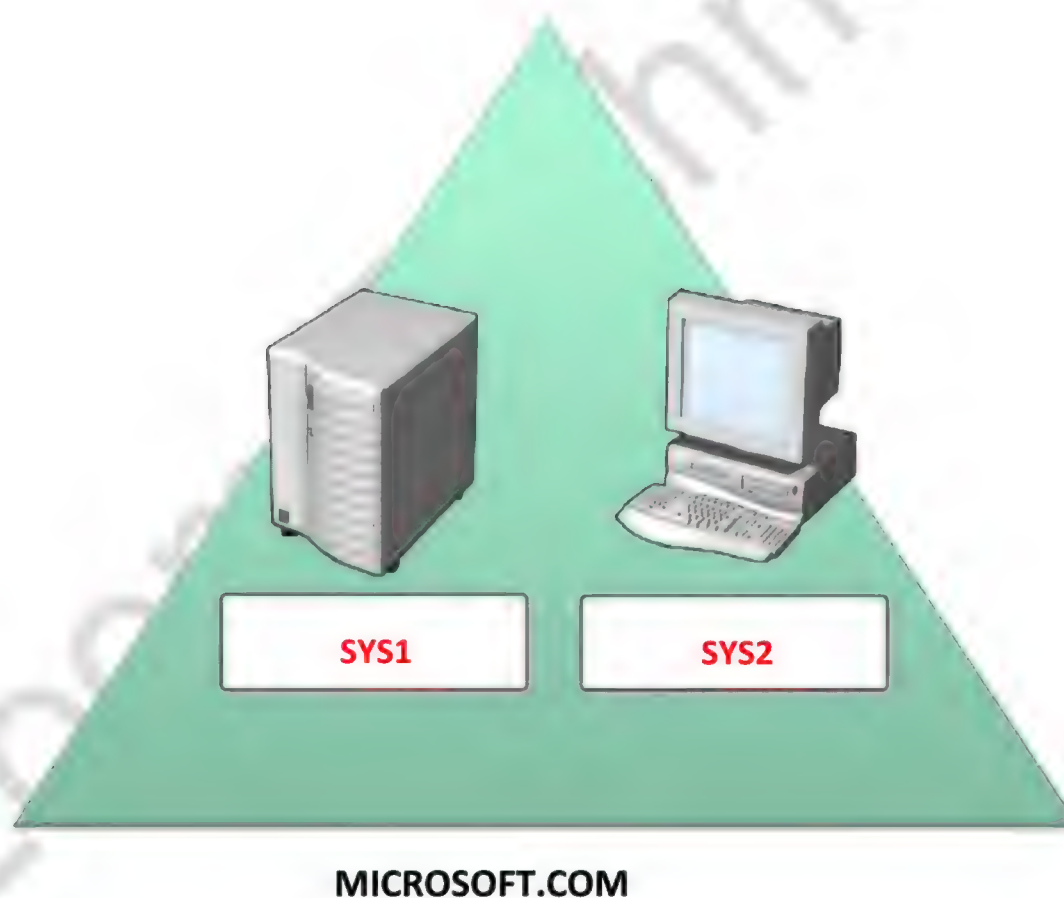
To change website IP address and port number in IIS

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



#### SYS1

##### Domain Controller/DNS/Web Server

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

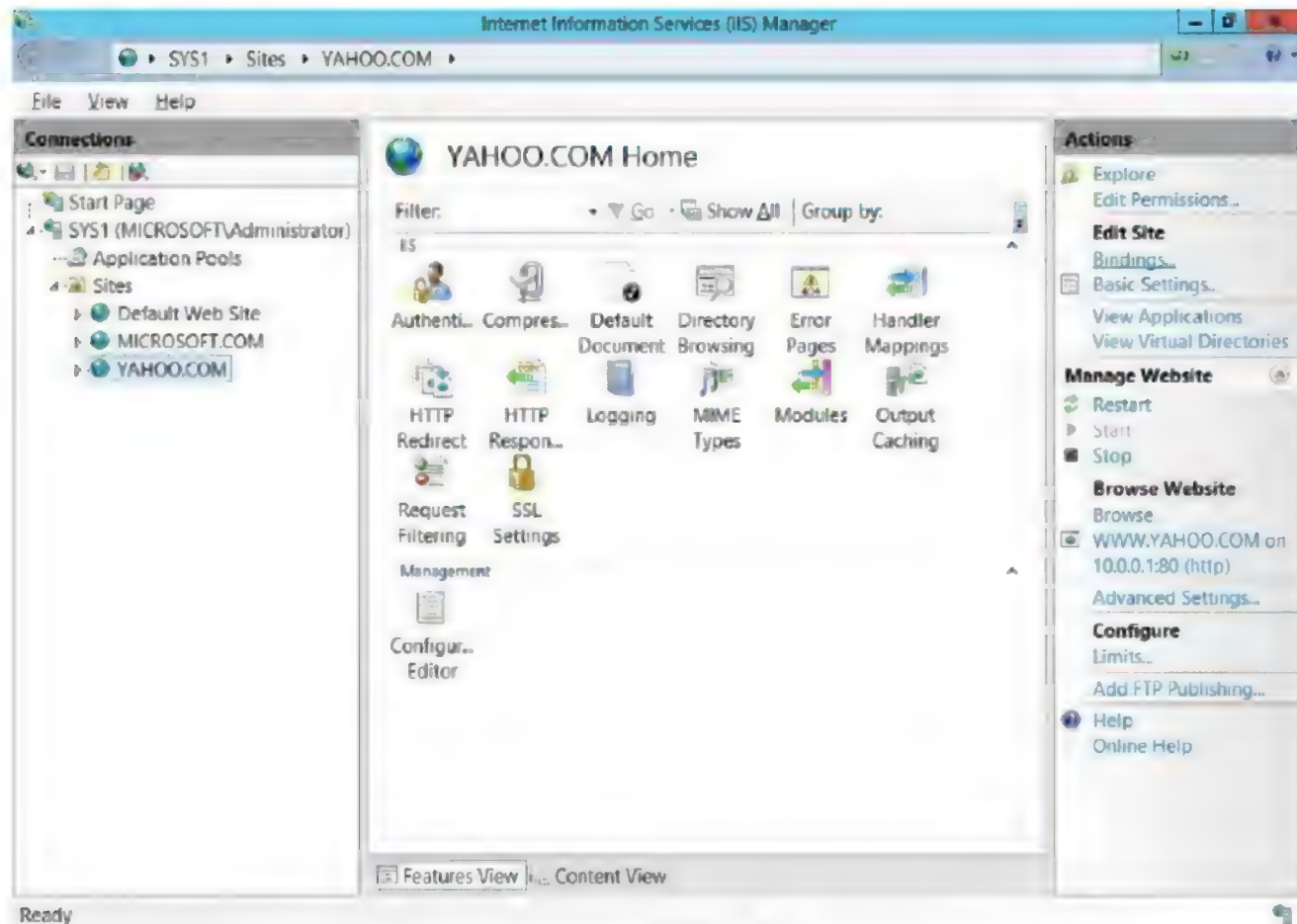
#### SYS2

##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

## Steps:

1. Go to Start, select **Internet Information Services Manager**.
2. Select the Web site → click **Bindings** in the Actions Pane.



3. Click **edit** and change the **IP address or port number or host name**.
4. If the port number is changed then the website can be accessed only by specifying the port number [http://www.yahoo.com:port\\_number](http://www.yahoo.com:port_number)





## Lab – 62: Creating Do not Isolate user FTP Site

### Objective:

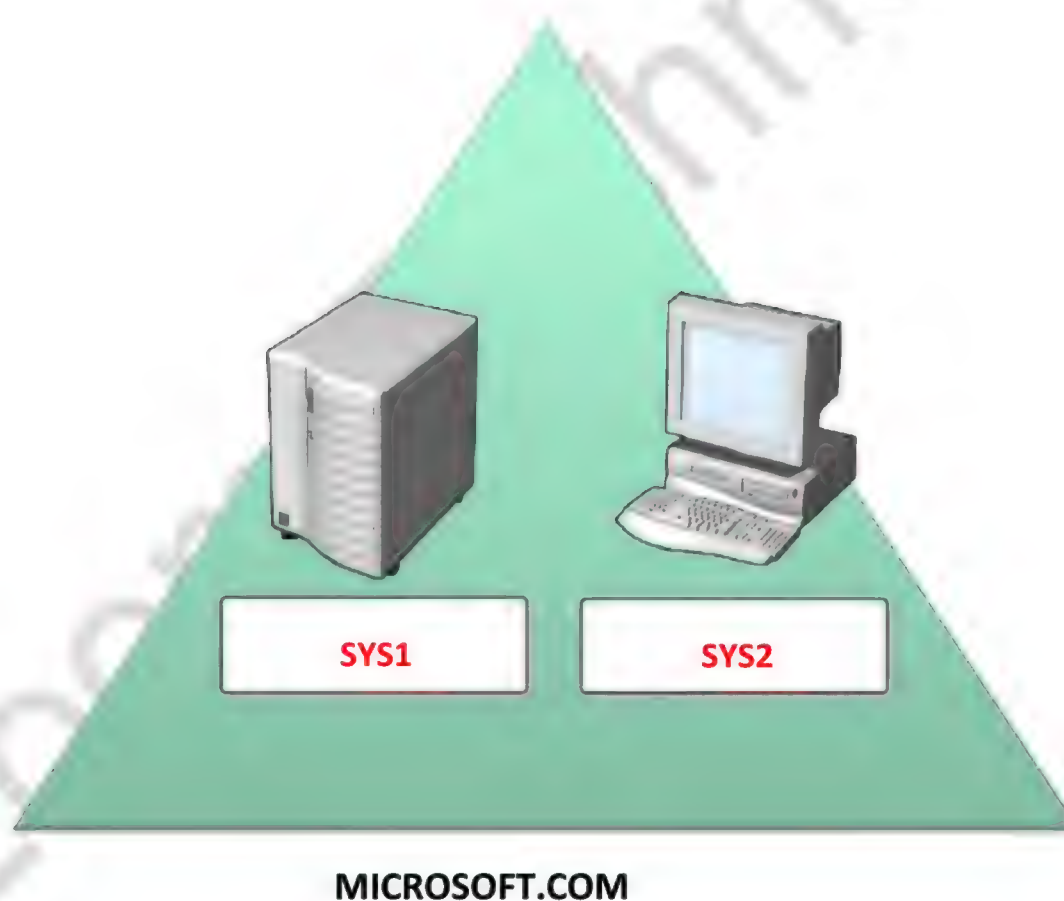
To host ftp site using iis

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or Windows 7.

### Topology:



#### SYS1

##### Domain Controller/DNS/Ftp Server

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

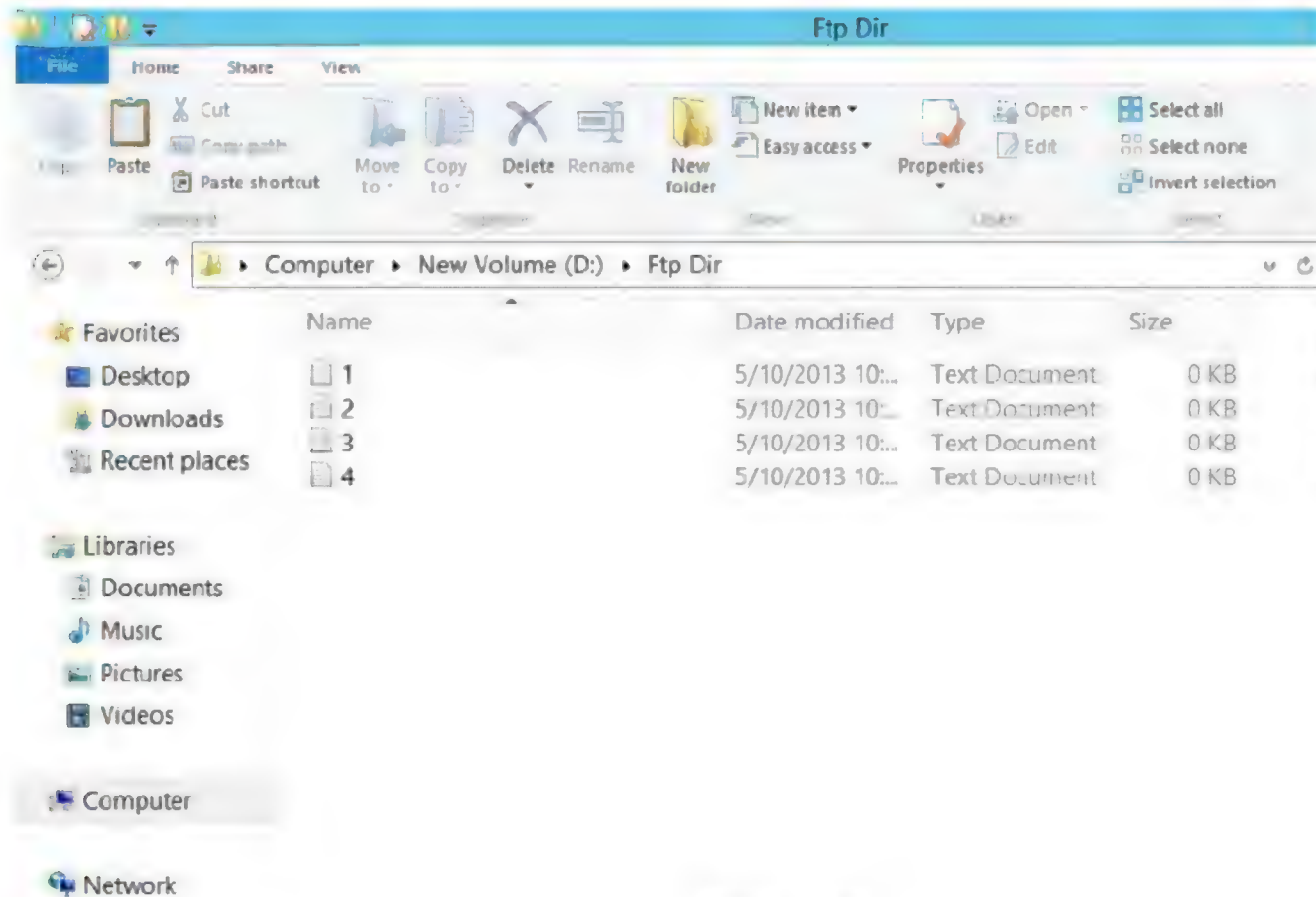
#### SYS2

##### Member Server / Client

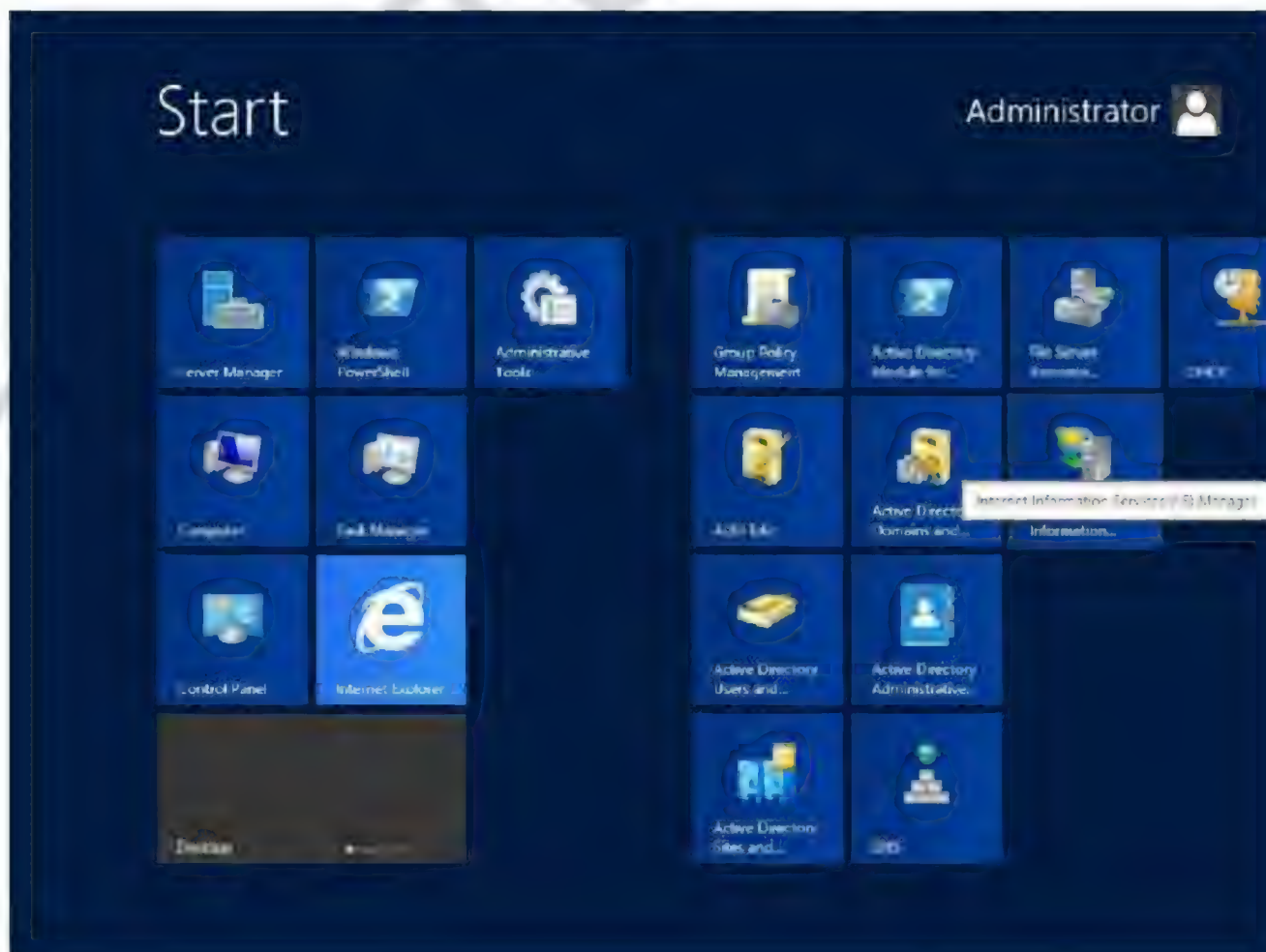
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

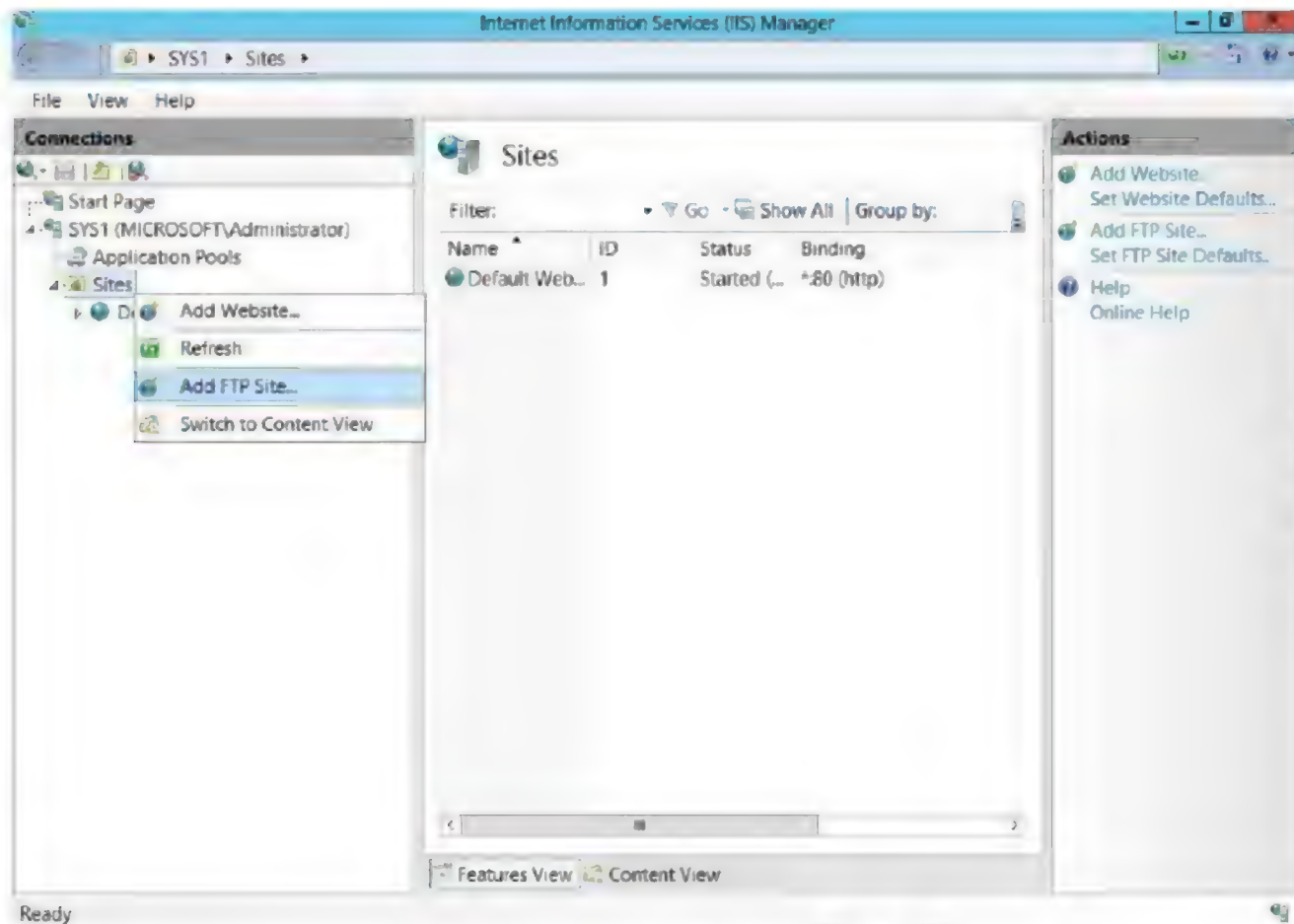
1. Open any drive and **create a folder (Ex: FTP Dir)** → Open the folder and **create some files Ex: 1.txt, 2.txt, 3.txt, 4.txt.**



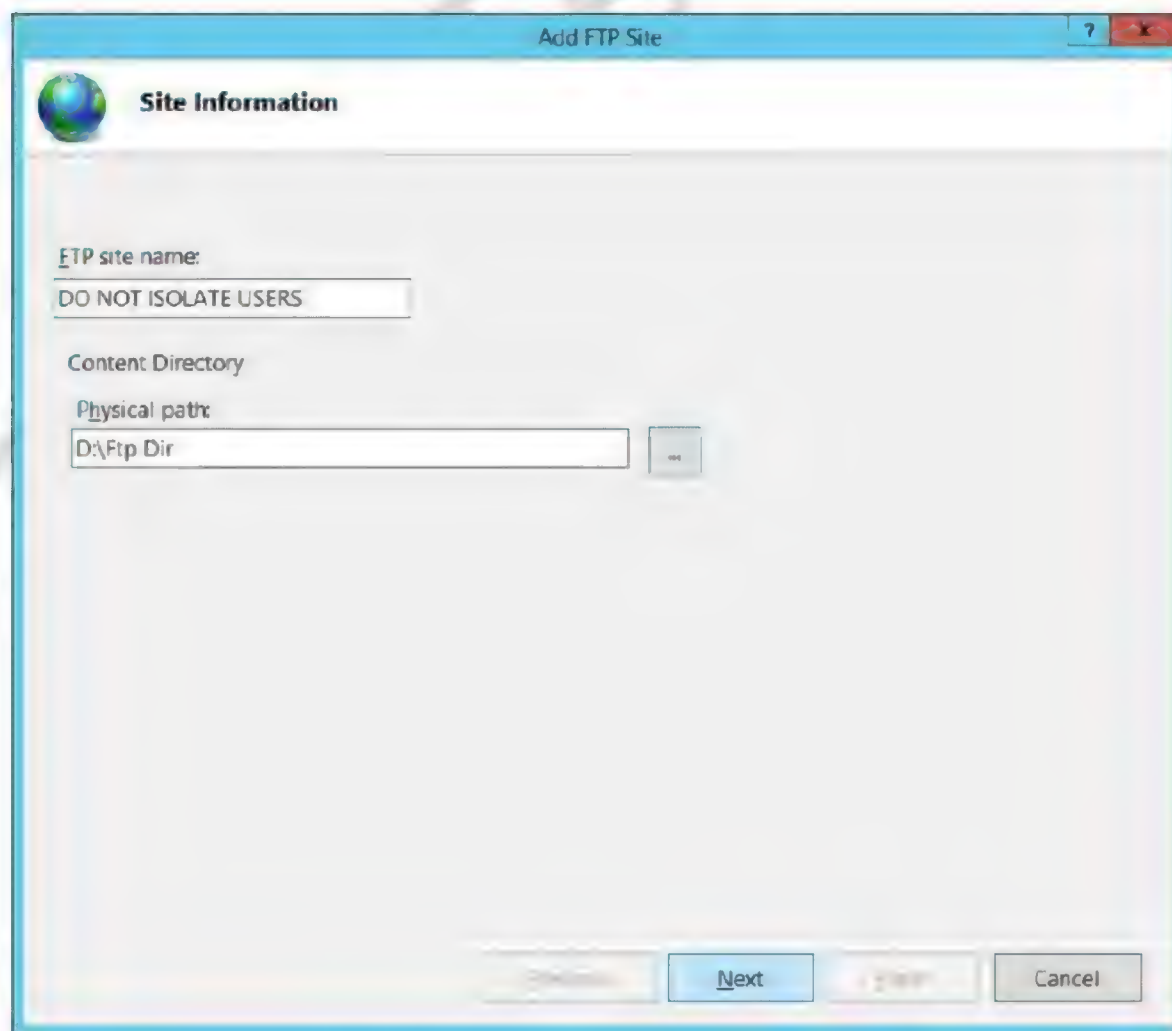
2. Go to Start, select **Internet Information Services (IIS) Manager**.



3. In the left pane of the **Internet Information Services** dialog box → Expand the server → Right click on **Sites** and select **ADD FTP Site**



4. In Site Information screen, enter the FTP site name, and enter the path to the home folder (Content Directory) you want to assign to this FTP site. This can be either a local path or a UNC path of the shared folder → you can **browse for this folder** if you need to → click **Next**.





5. In the **Bindings and SSL Settings** dialog box select the IP address and port no. and select “**NO SSL**”.

**Add FTP Site**

**Binding and SSL Settings**

Binding

IP Address:  Port:

☐ Enable Virtual Host Names:  
Virtual Host (example: ftp.contoso.com):

☒ Start FTP site automatically

SSL

☒ No SSL

☐ Allow SSL

☐ Require SSL

SSL Certificate:

6. In Authentication and Authorization Information dialog box, Check the box for **Anonymous** and **Basic**, Select **All Users**, Check the box for **Read** and **Write** → click **Finish**.

**Add FTP Site**

**Authentication and Authorization Information**

Authentication

☒ Anonymous

☒ Basic

Authorization

Allow access to:

Permissions

☒ Read

☒ Write

**Verification:**

Accessing the FTP site from the Client systems

**SYS2 – CONFIGURATION**

1. Go to any Computer → Open Internet Explorer and type [ftp://ftp\\_ip\\_address](ftp://ftp_ip_address) and Press Enter.

Ex: <ftp://10.0.0.1>



## Lab – 63: Installing and Configuring Windows Deployment Services

### Objective:

To deploy operating system through network using WDS

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller, DHCP with Scope, DNS with Services records.
- A computer with or without any Operating system.

### Topology:



#### SYS1

##### Domain Controller / WDS Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### WDS Client

IP Address      -----  
Subnet Mask    -----  
Preferred DNS   -----



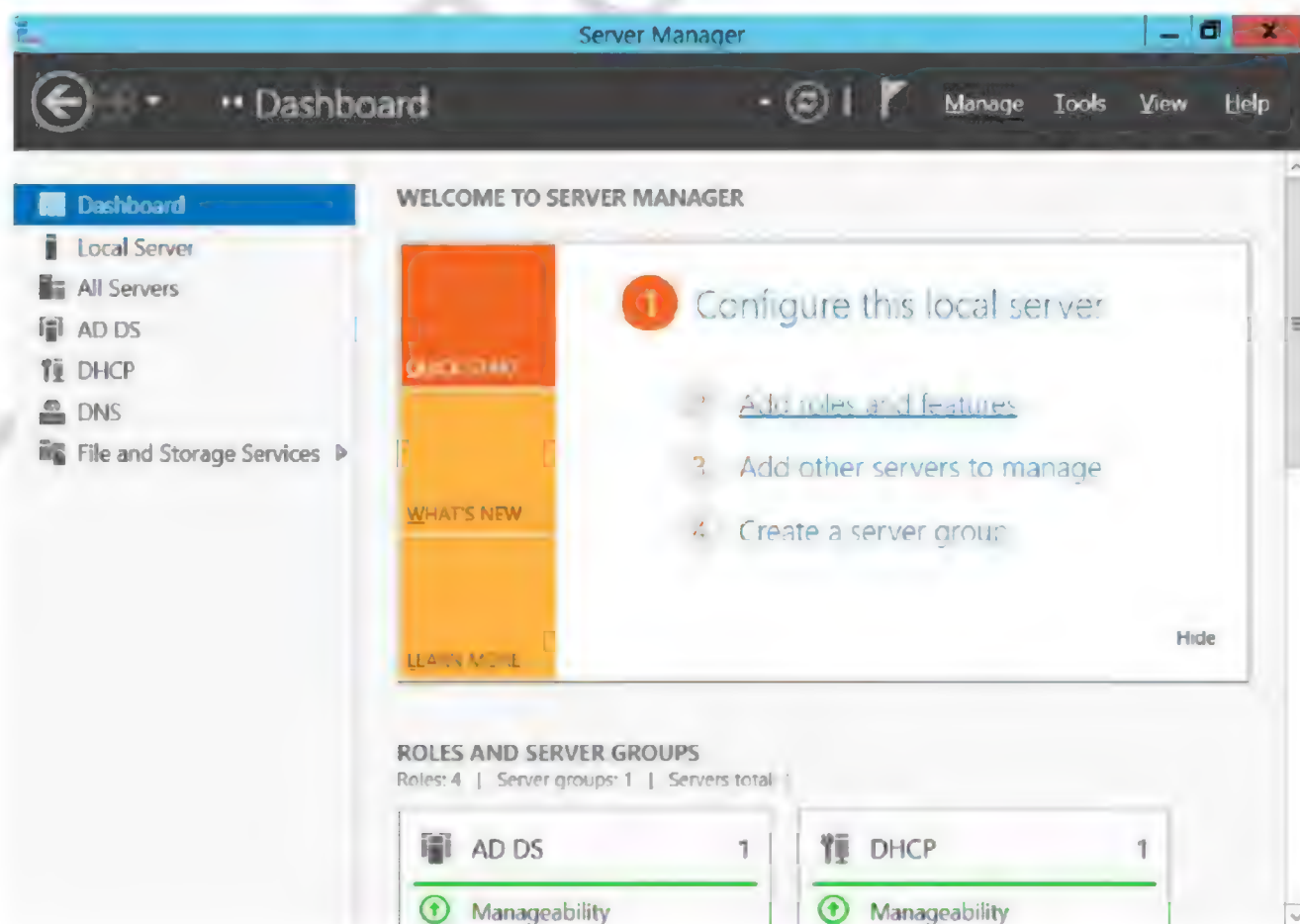
## Installing Windows Deployment Services

### SYS1 – CONFIGURATION

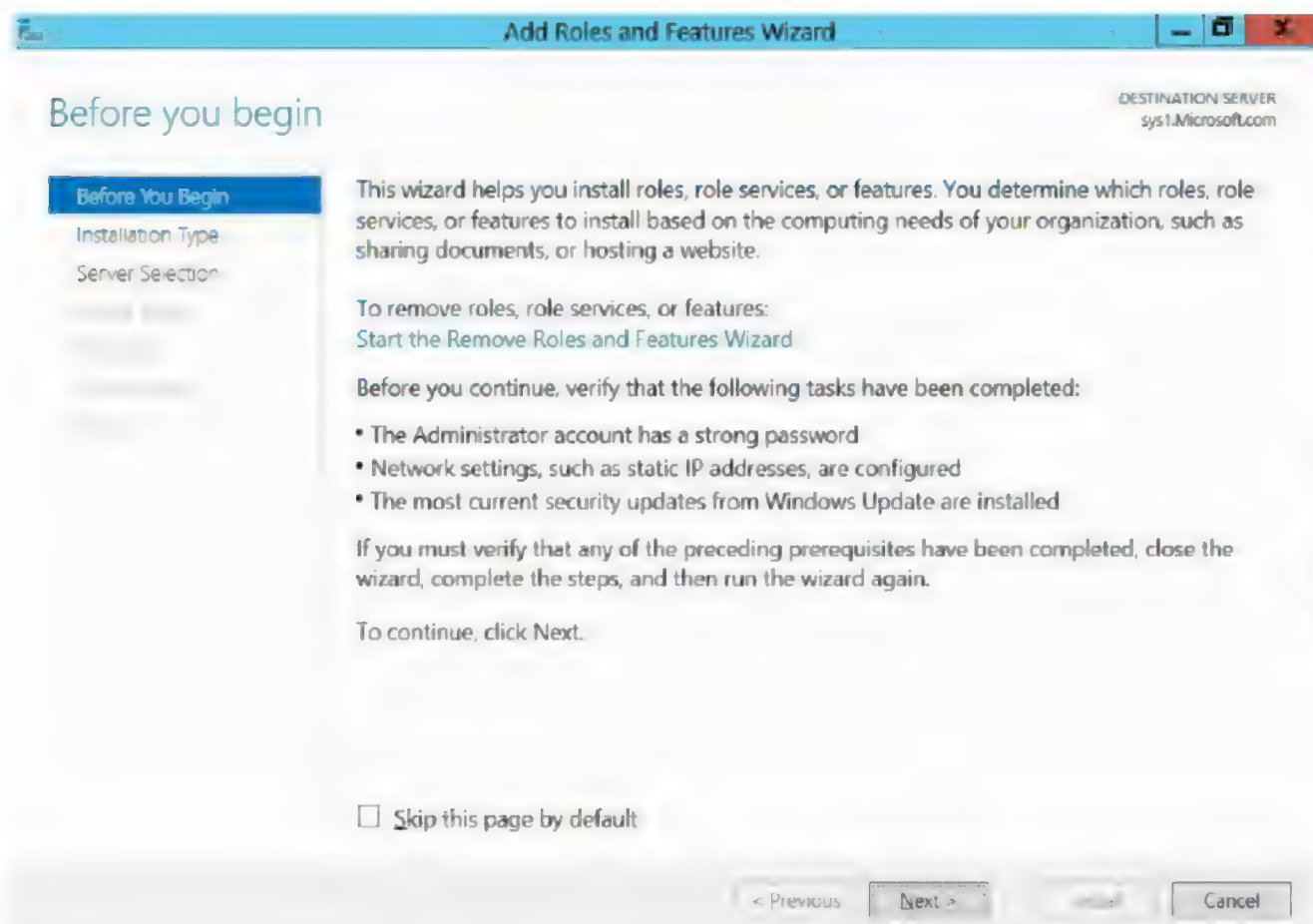
1. Go to Start, click Server Manager



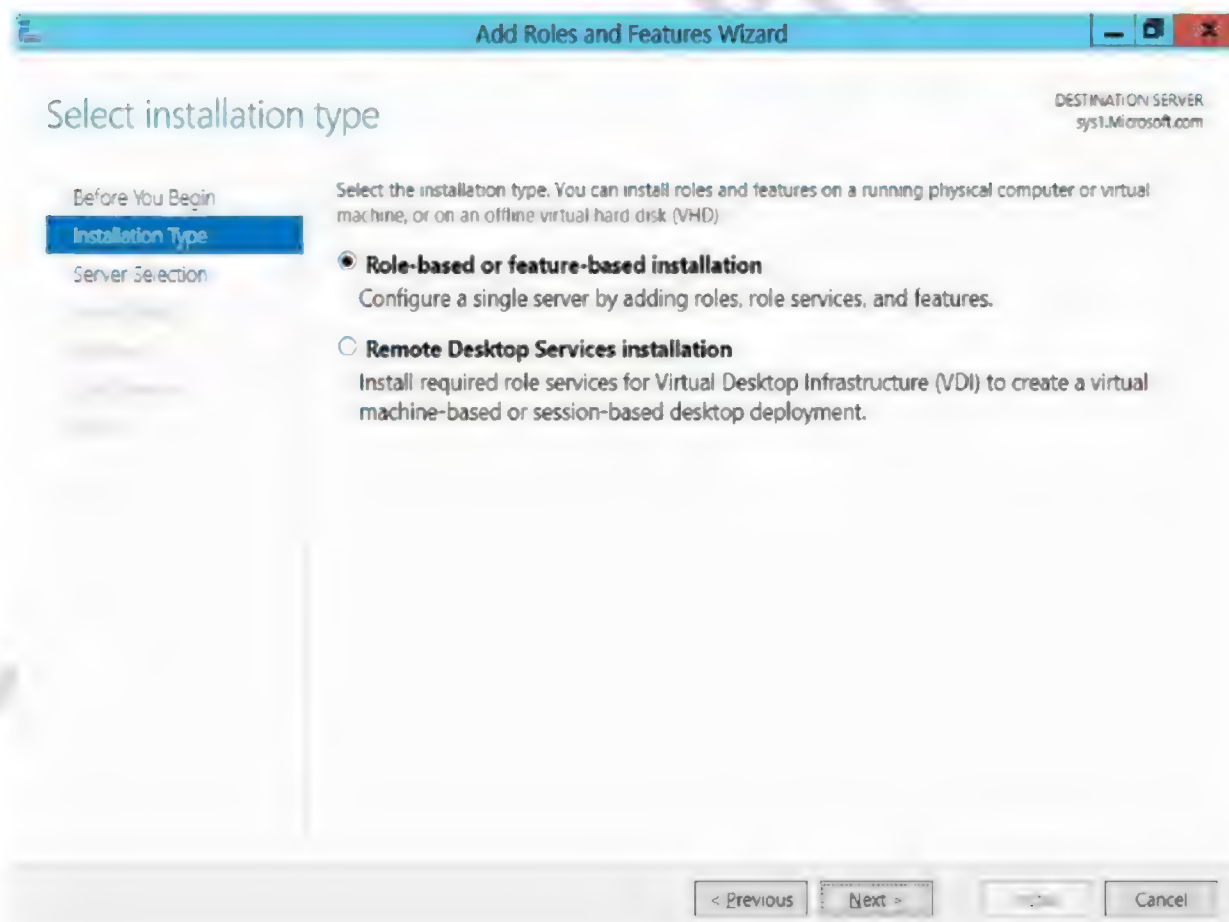
2. In the Server Manager Console, Select **Add roles and features**



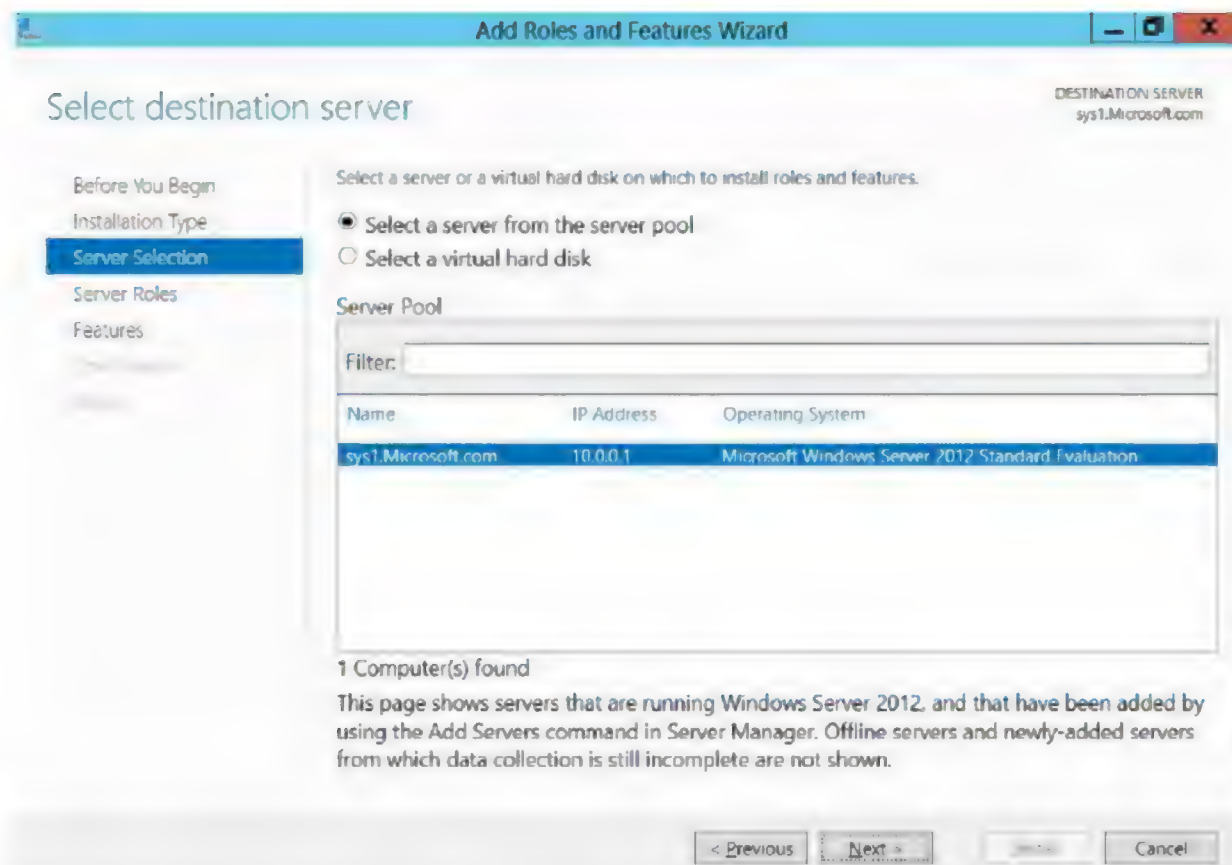
3. In Before you begin page, click **Next**.



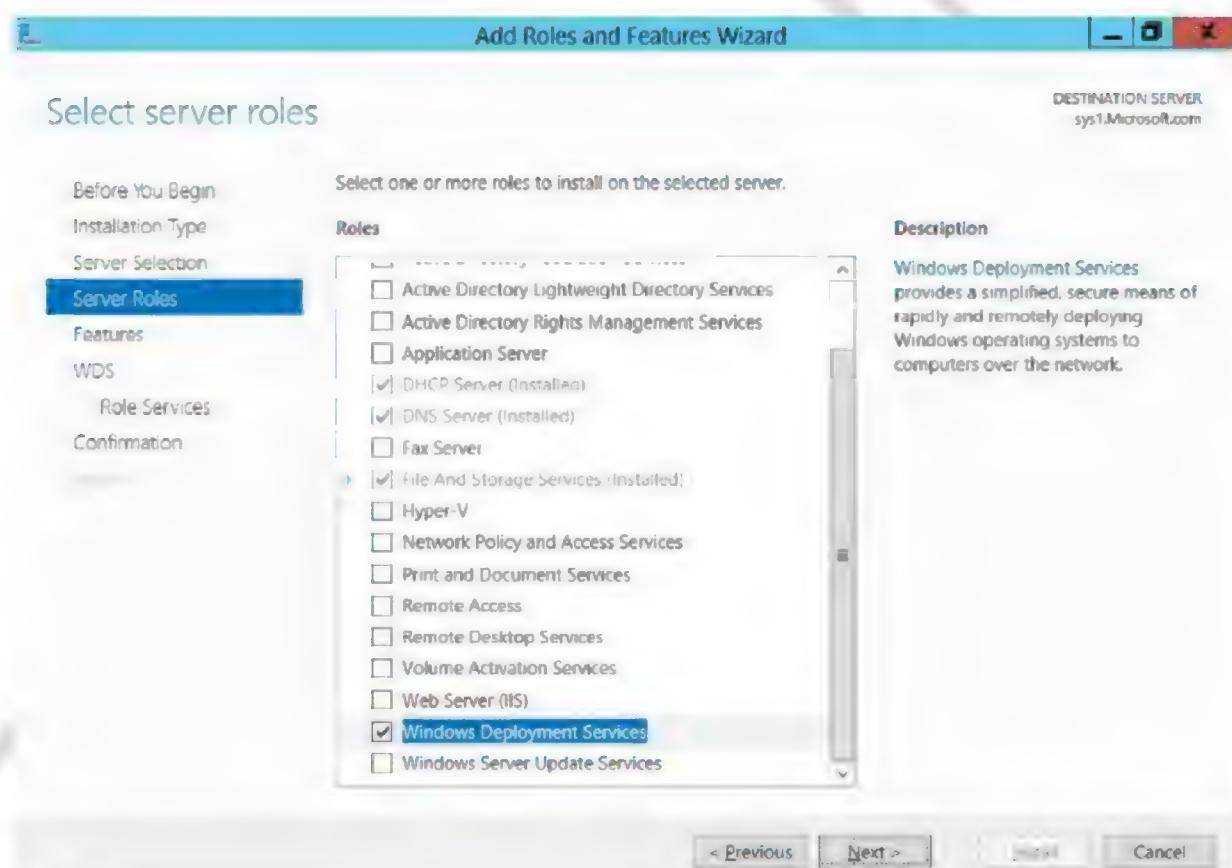
4. Select **Role-based or feature-based installation**, click **Next**.



- Select a server (**sys1.Microsoft.com**) from the server pool and click **Next**.

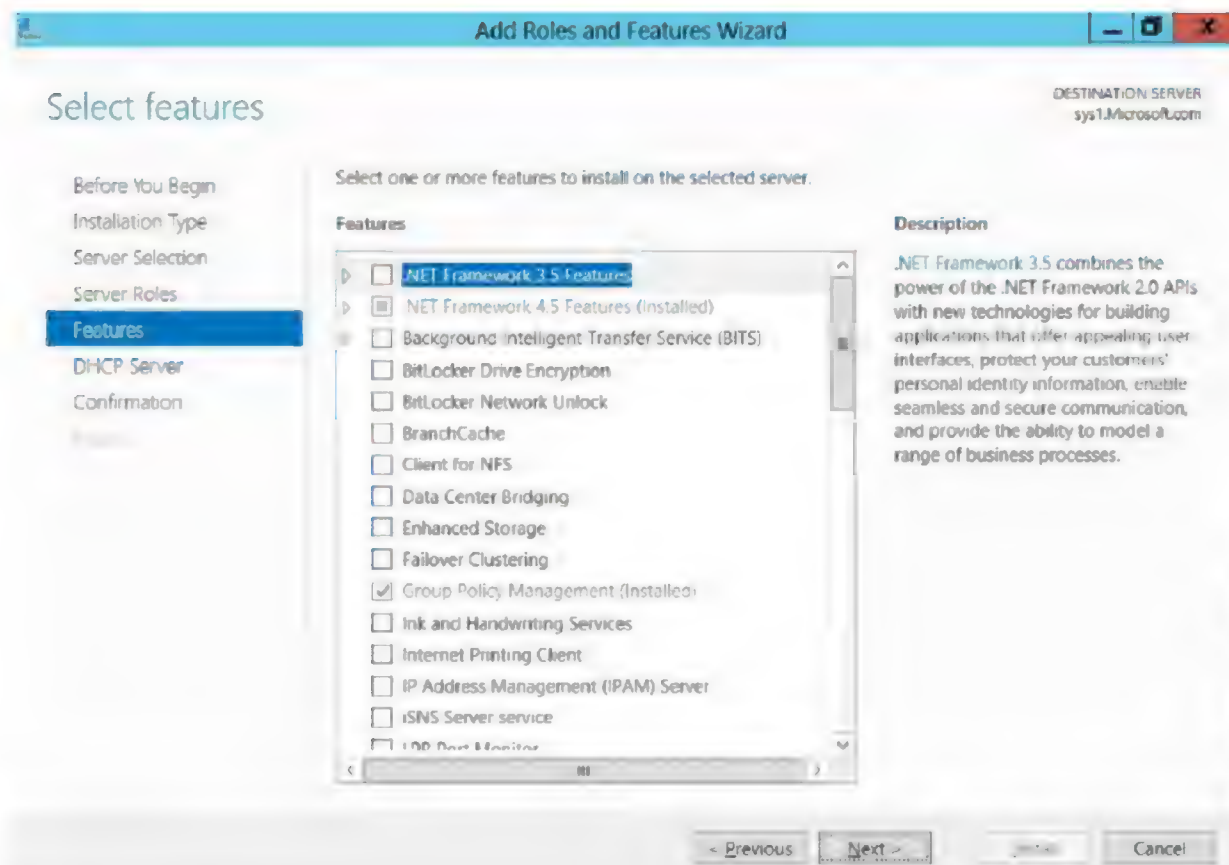


- In select server roles, check the box **Windows Deployment Services**, click **Next**.

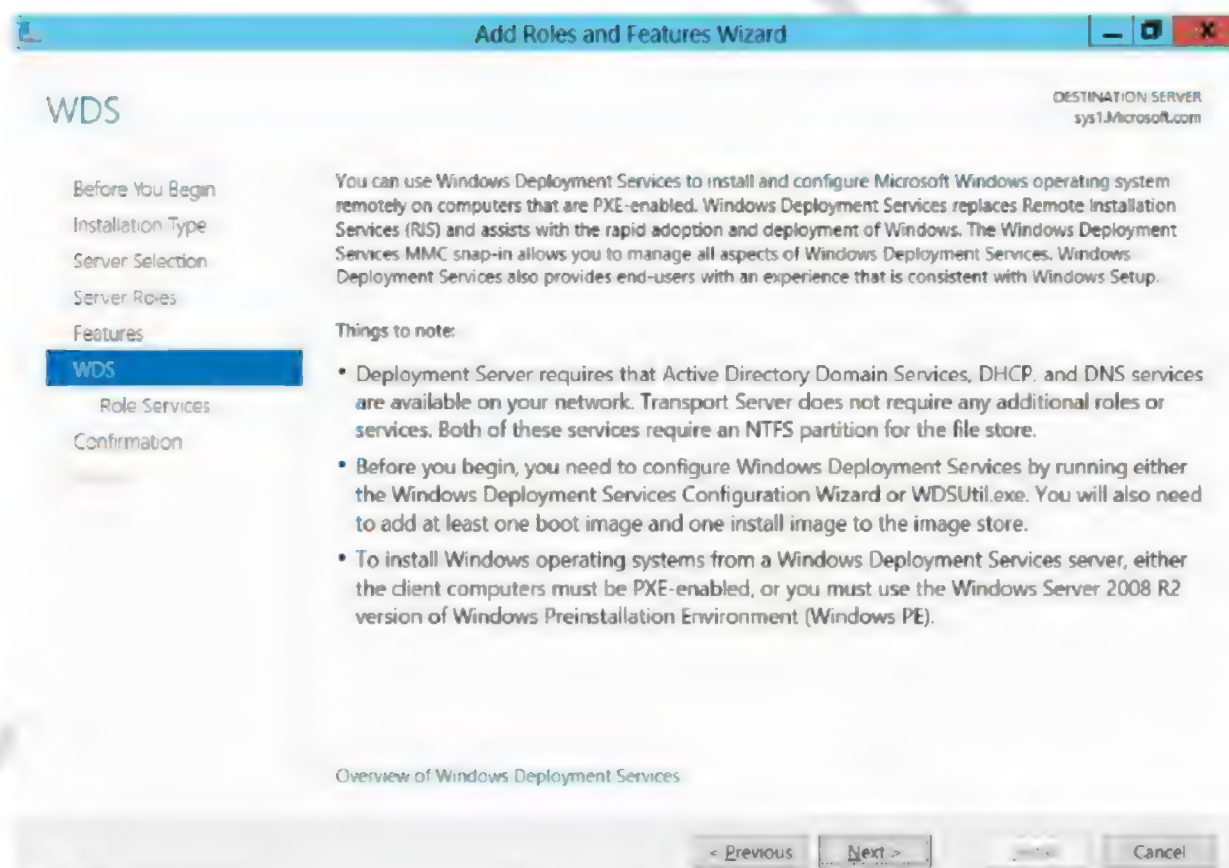




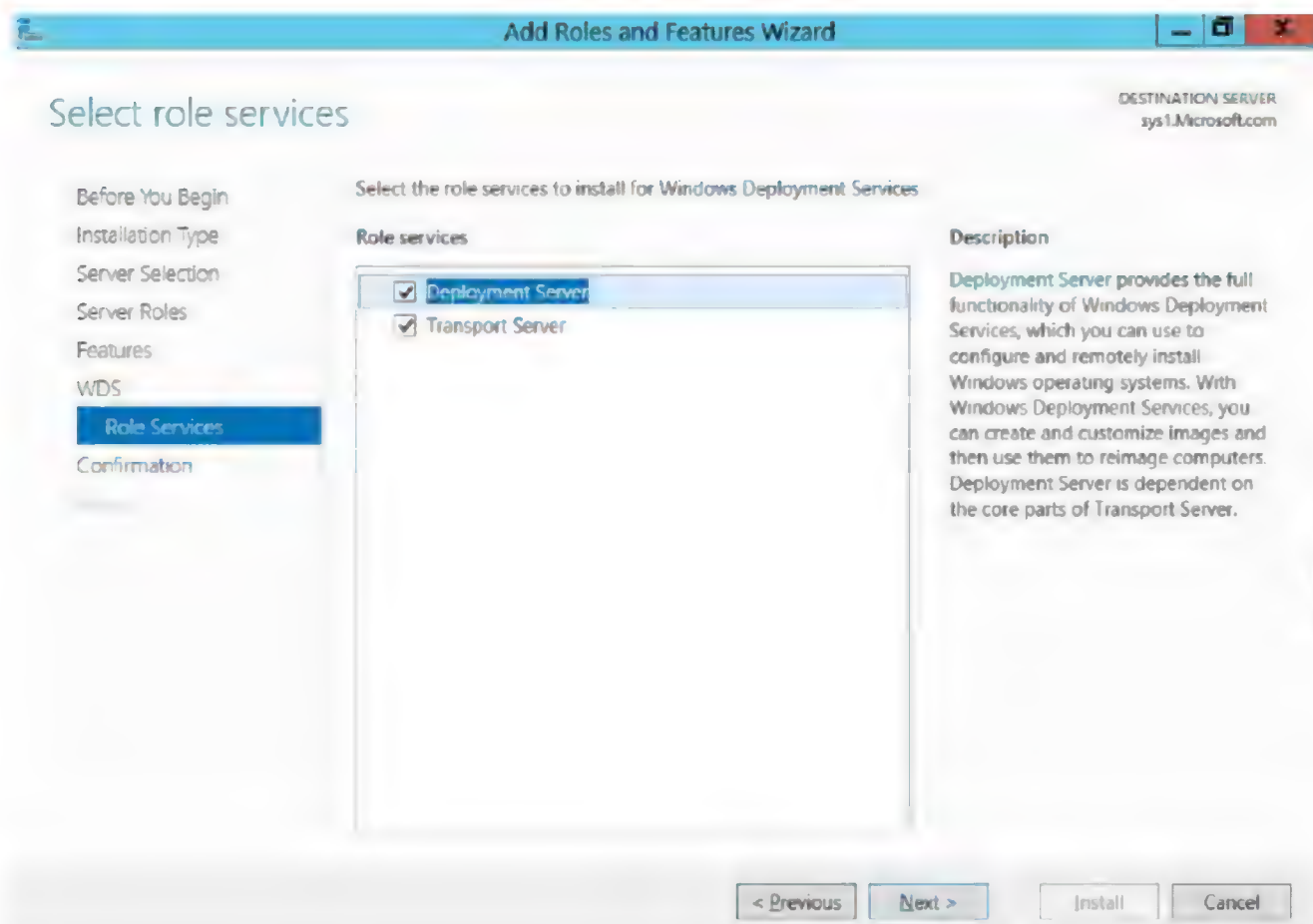
7. In select features, click **Next**.



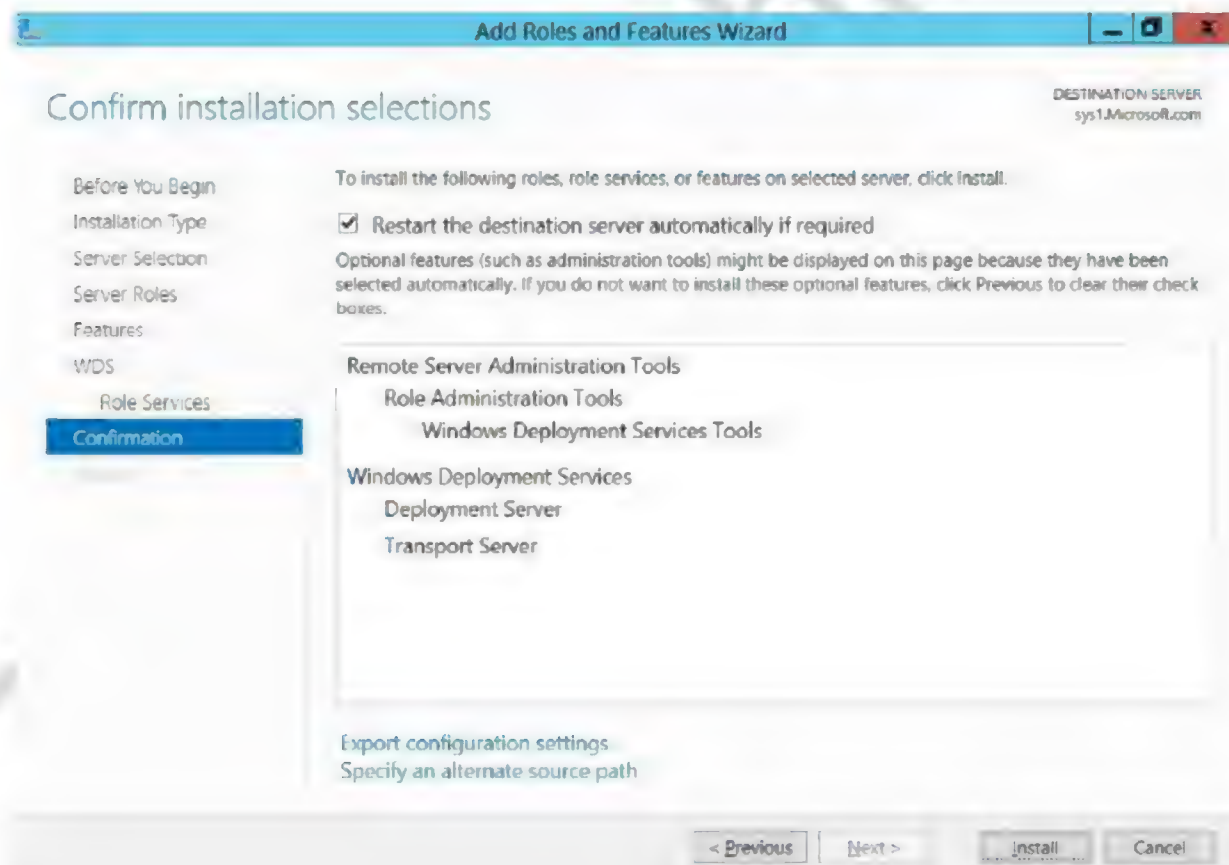
8. Click **Next**.



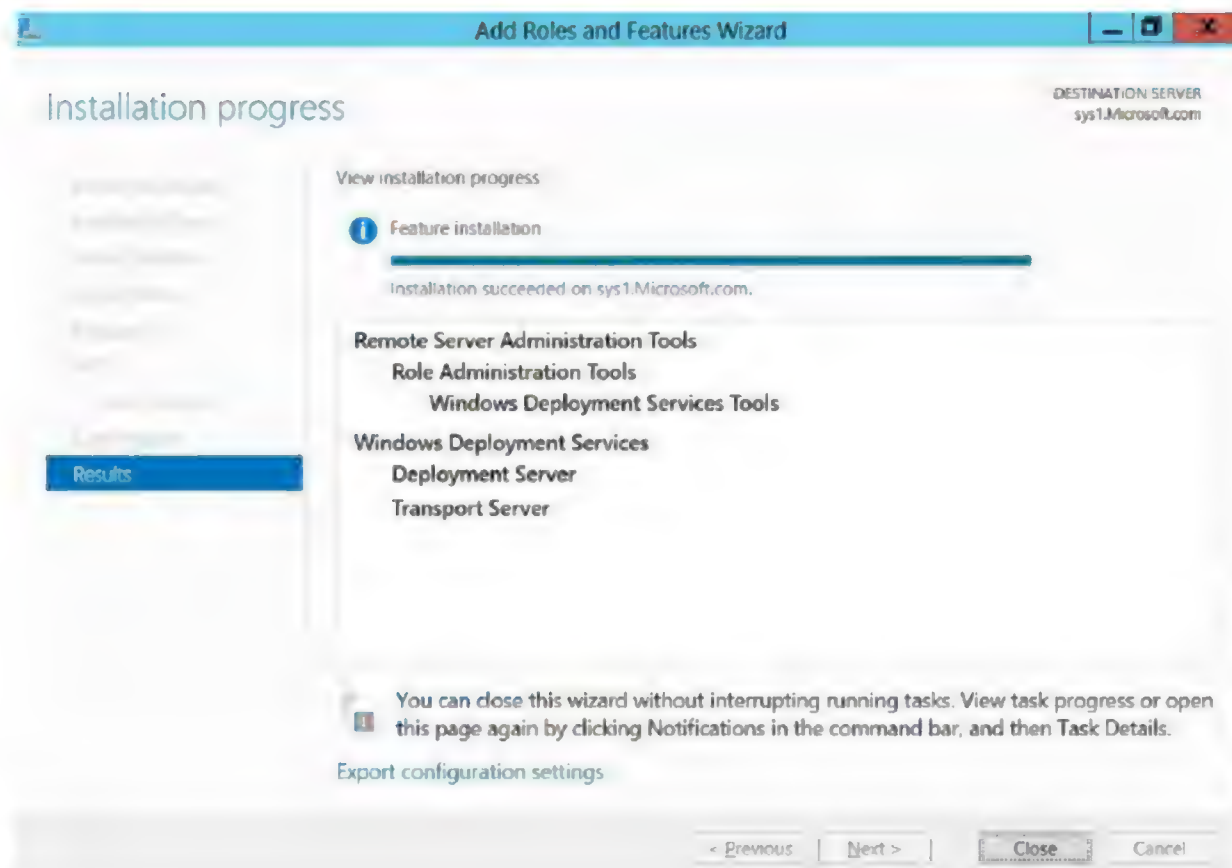
9. In Select role services, Deployment and Transport Server is selected, click **Next**.



10. Check Restart the destination server automatically if required and click **Install**.



11. Click Close to complete the Installation.



**Note: SYS1 – CONFIGURATION**

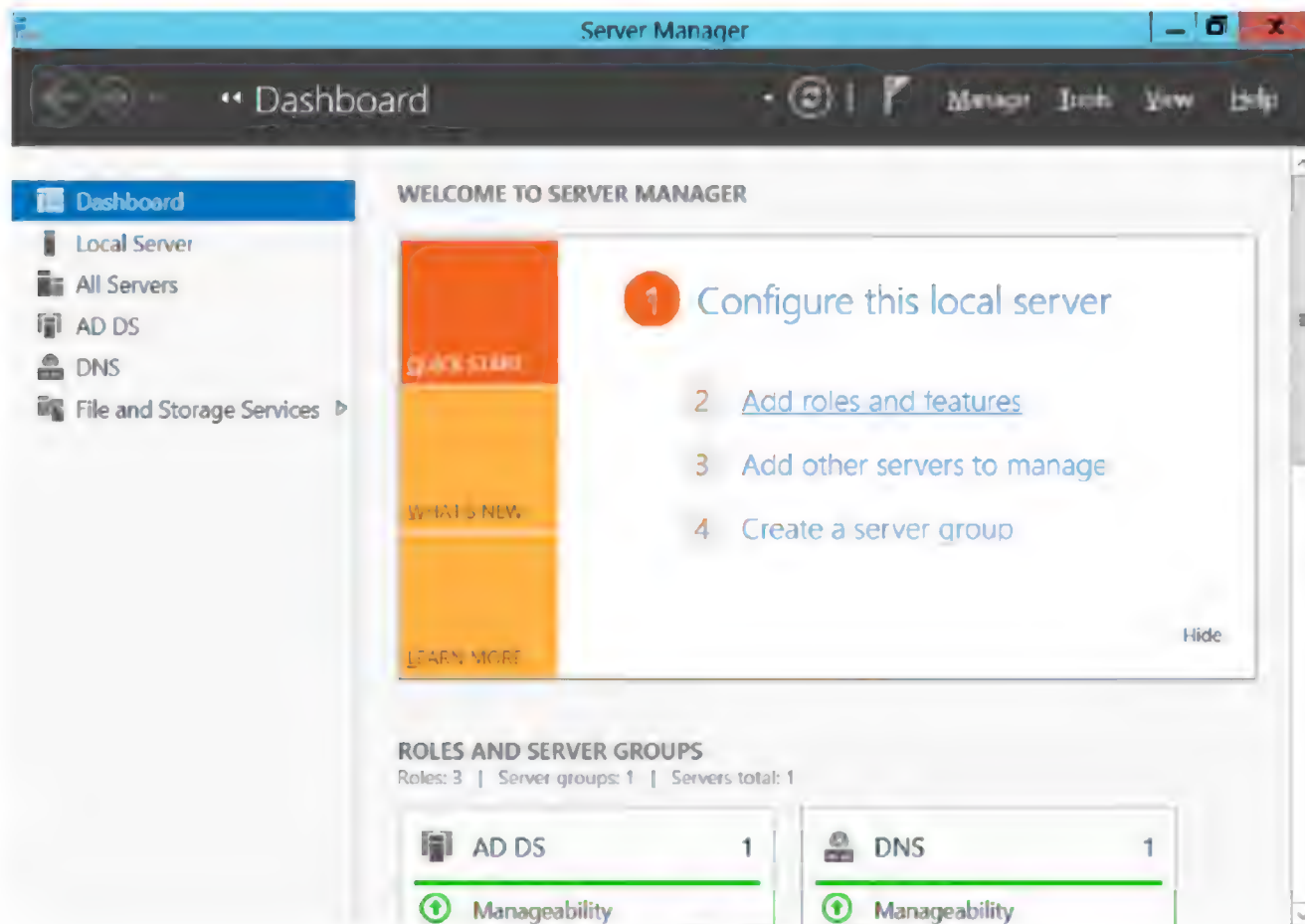
- Install the DHCP Service (If not installed) and create a scope in the DHCP.
- Give the range (10.0.0.10 – 10.0.0.100), and in the DHCP scope options mention the Domain name (Microsoft.com) and mention the DNS server IP address (10.0.0.1).



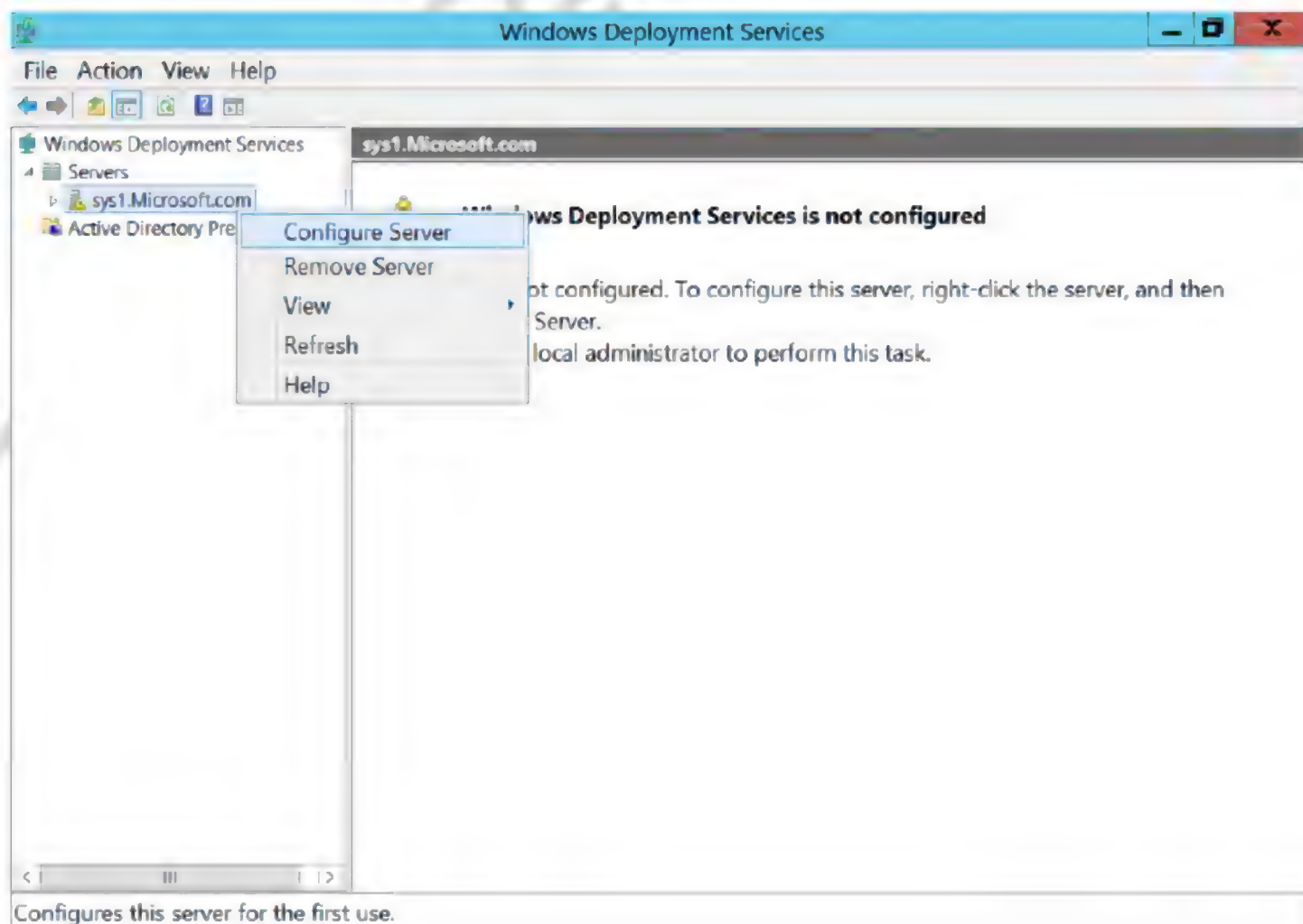
## Configuring Windows Deployment Services

### SYS1 – CONFIGURATION

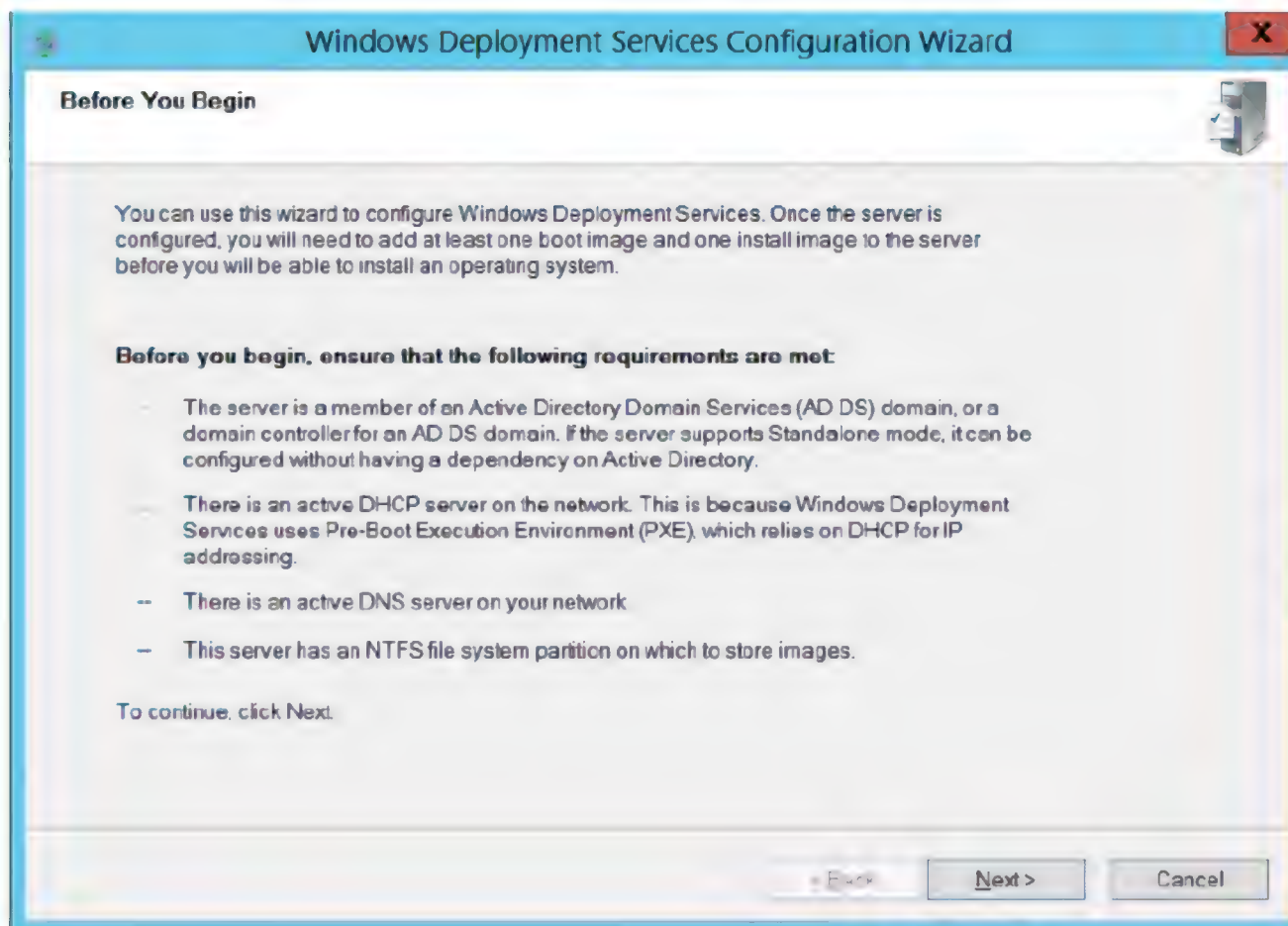
1. Go to Start, select Windows Deployment Services.



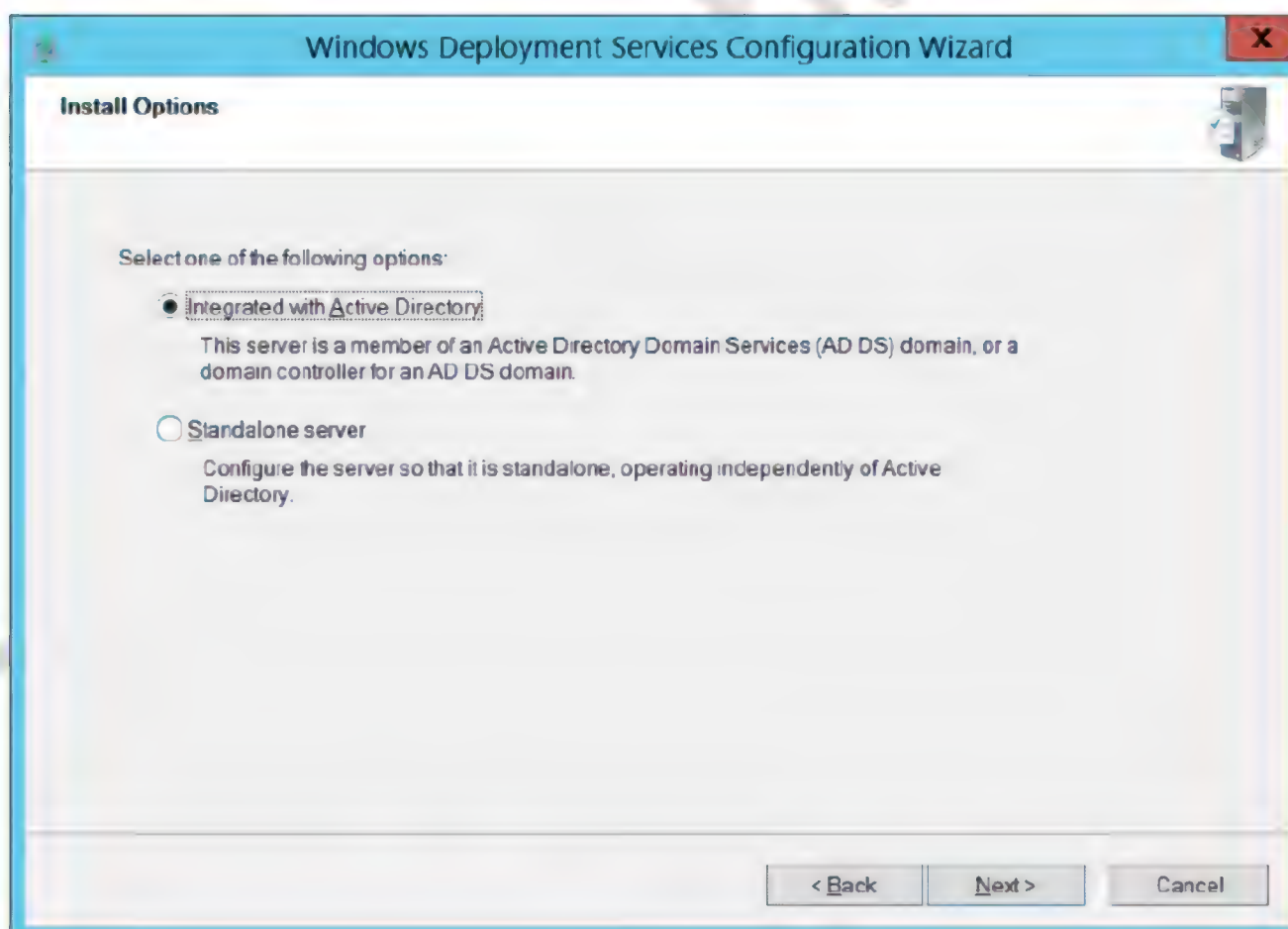
2. Right click **Server Name**, Select **Configure Server**.



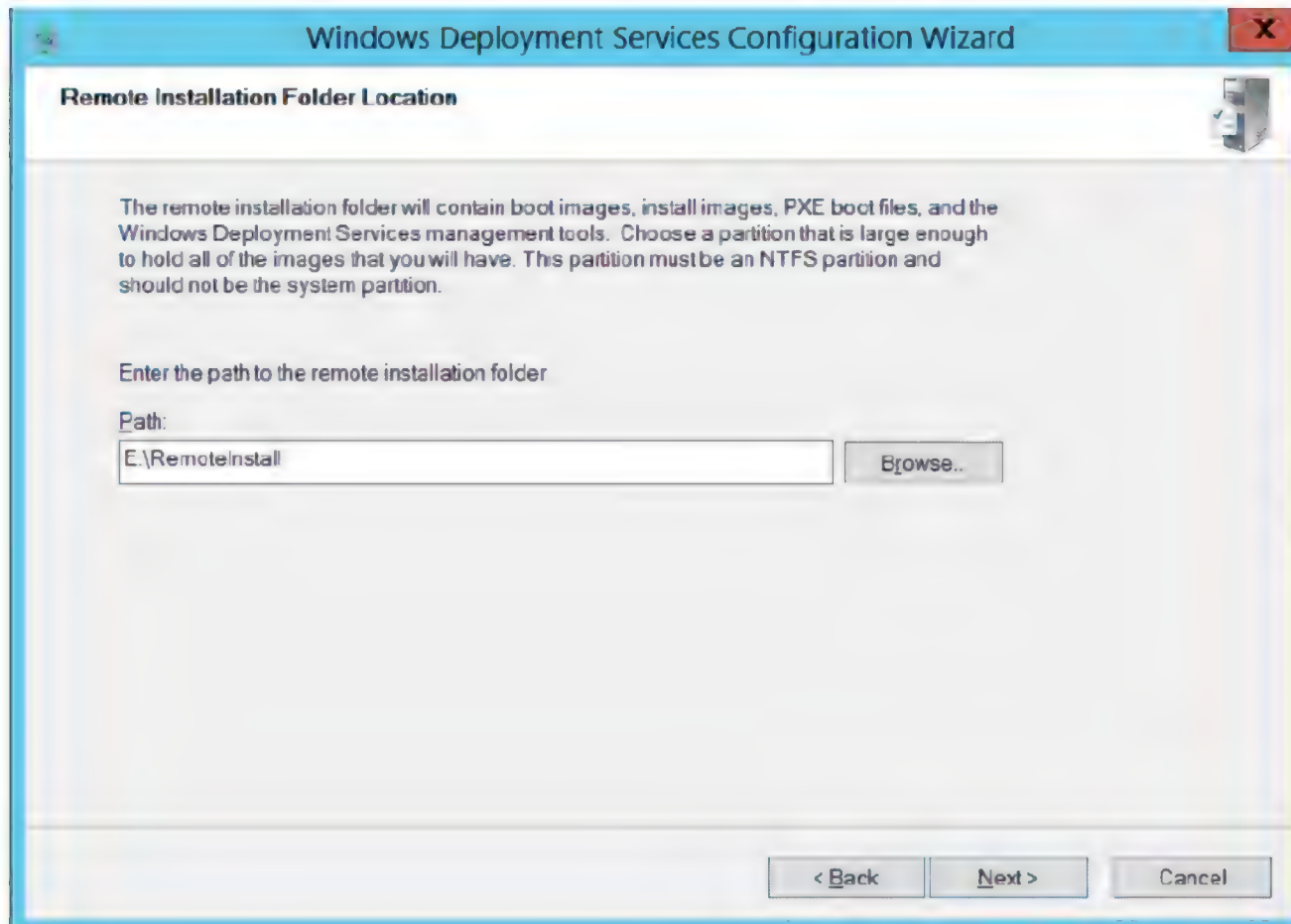
3. In Before You Begin Page, click **Next**.



4. In Install Options, in Domain Model select **Integrated with Active Directory**, click **Next**.

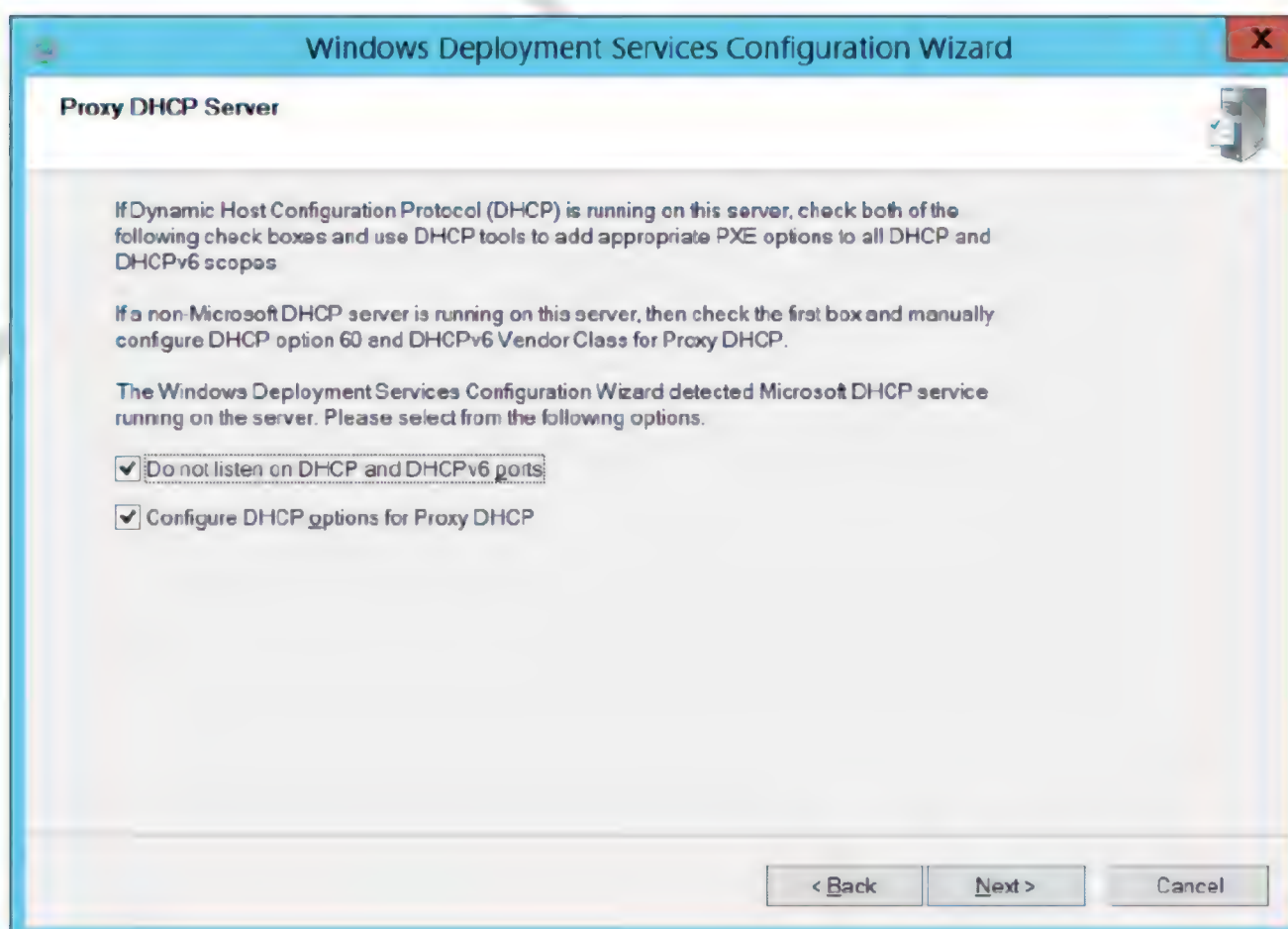


5. Browse and select any empty drive to store **Image Folder** (or) change the Drive letter click **Next**.



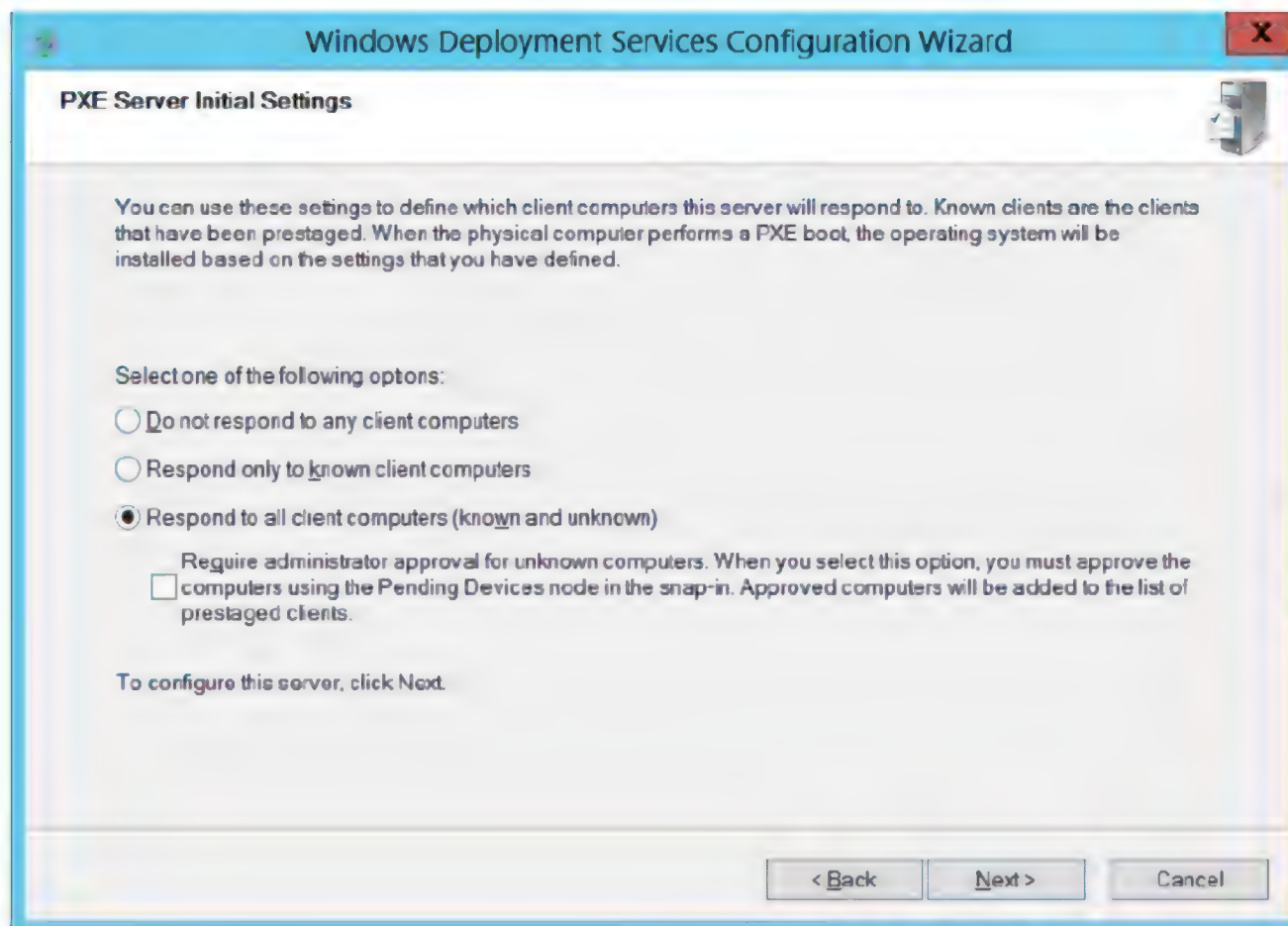
**Note:** If the WDS server is a DHCP server also then one more wizard will be displayed indicating that the WDS service should not listen on port 67.

So, we have to check the boxes, **Do not listen on port 67** and **Configure DHCP option tag 60** in all DHCP scope options to PXE Client.





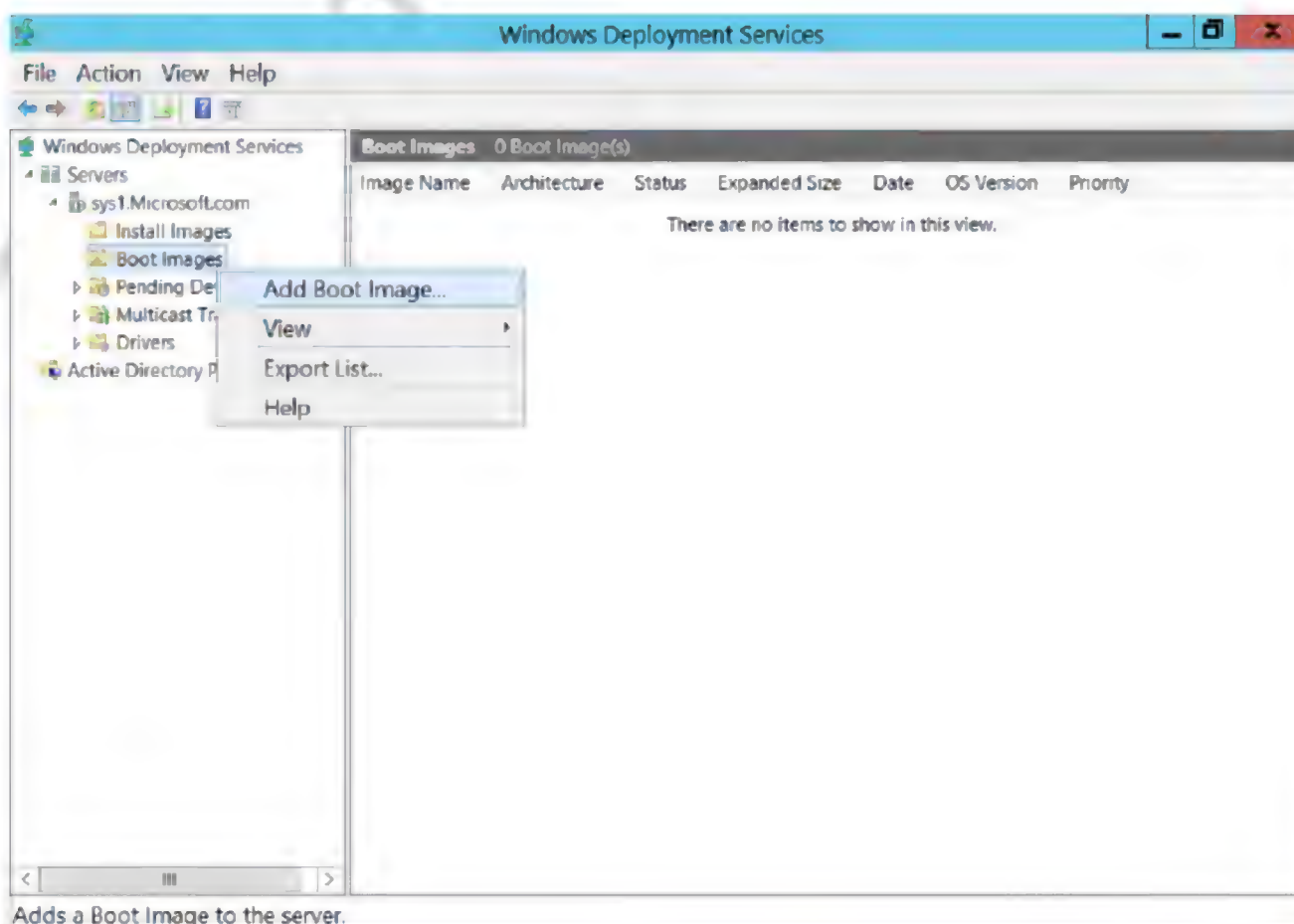
6. Select **Respond to all Known and Unknown Client Computers**, and click **Next**.



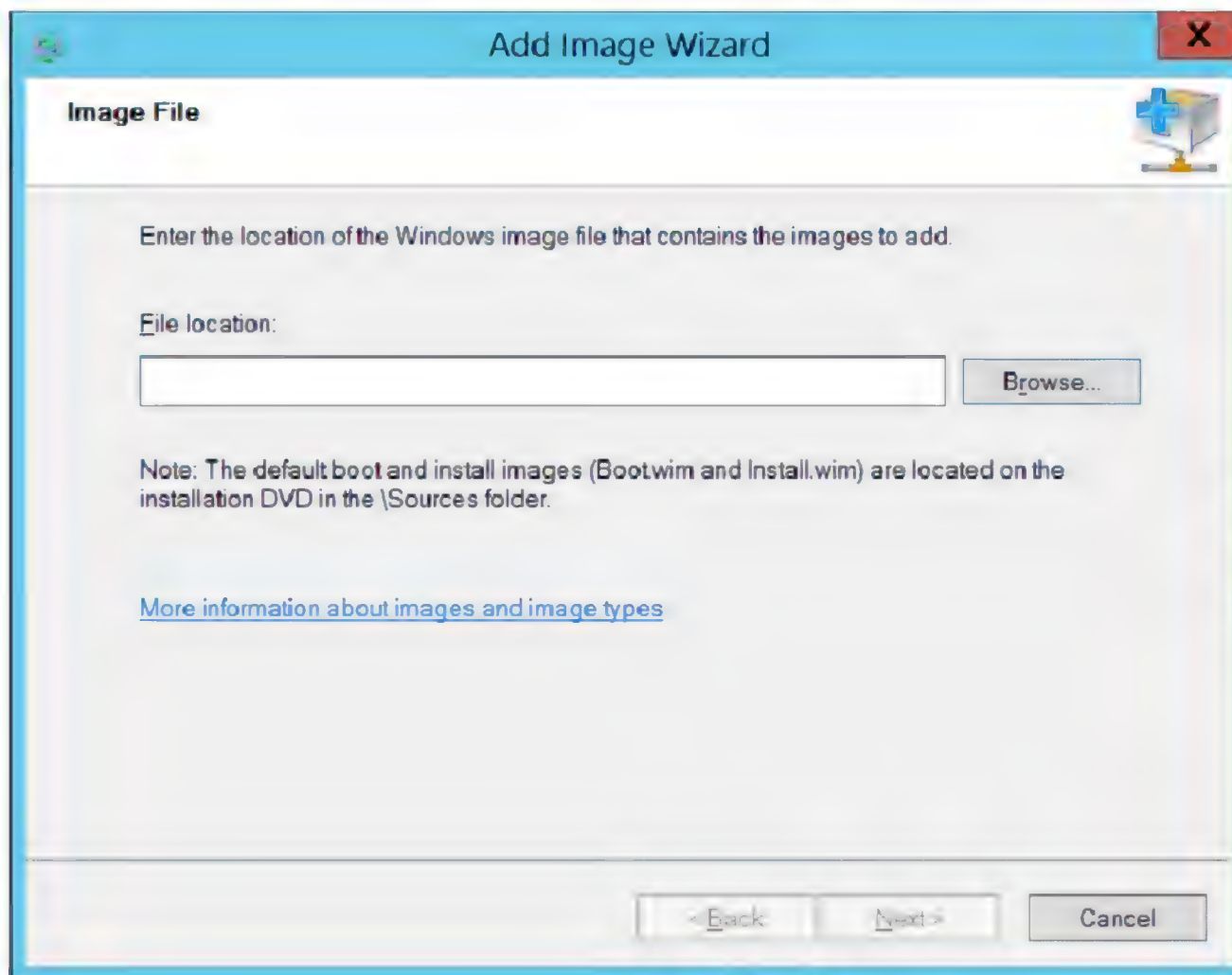
7. Wizard will Configure the **WDS Server**
8. Uncheck the box **Add Images** to Windows Deployment Server now, and click **Finish**.
9. **WDS Server Service** configured successfully and started.

## Adding Windows 2012 Boot Image to WDS Server

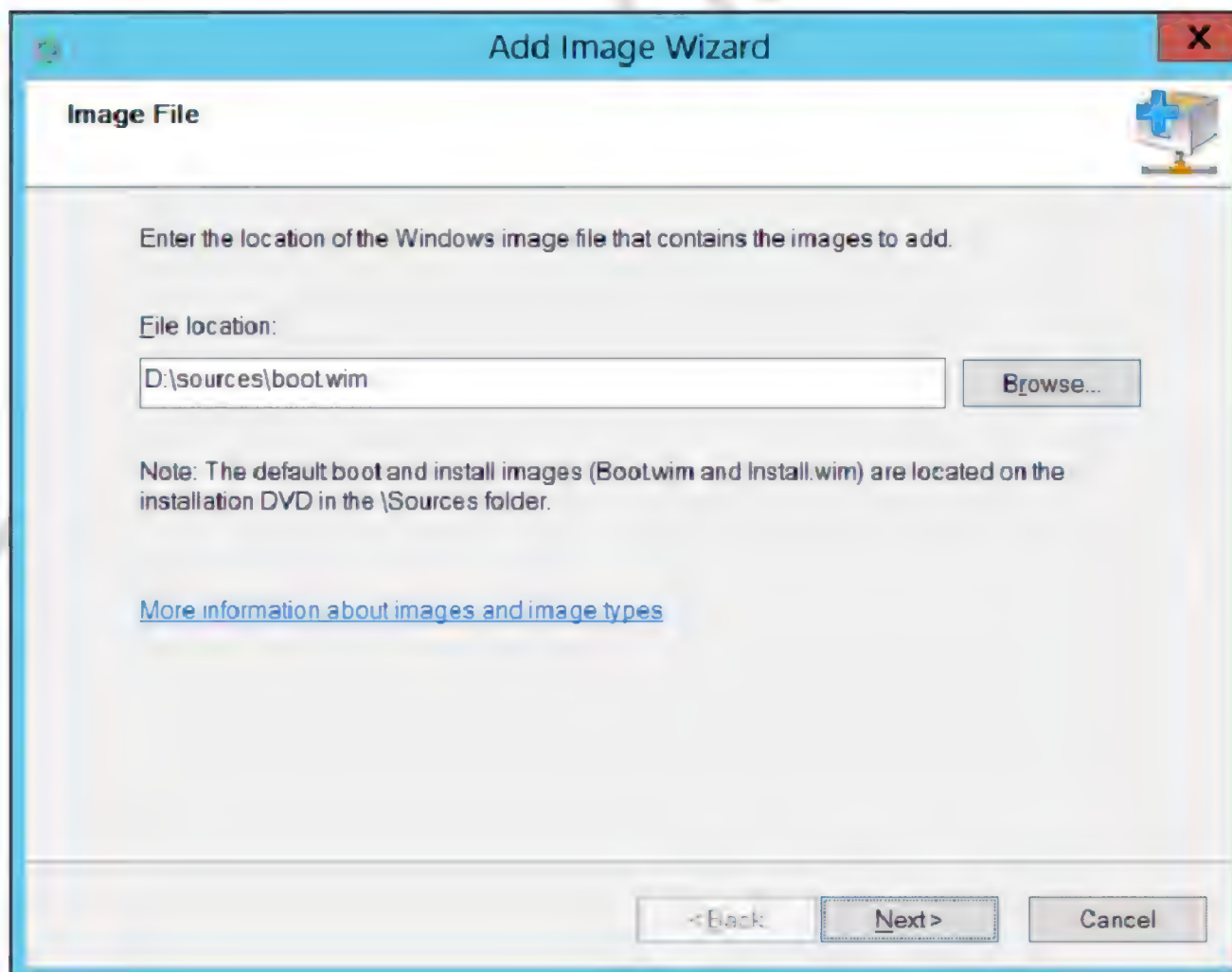
1. Right click Boot Images Select **Add Boot Image**.



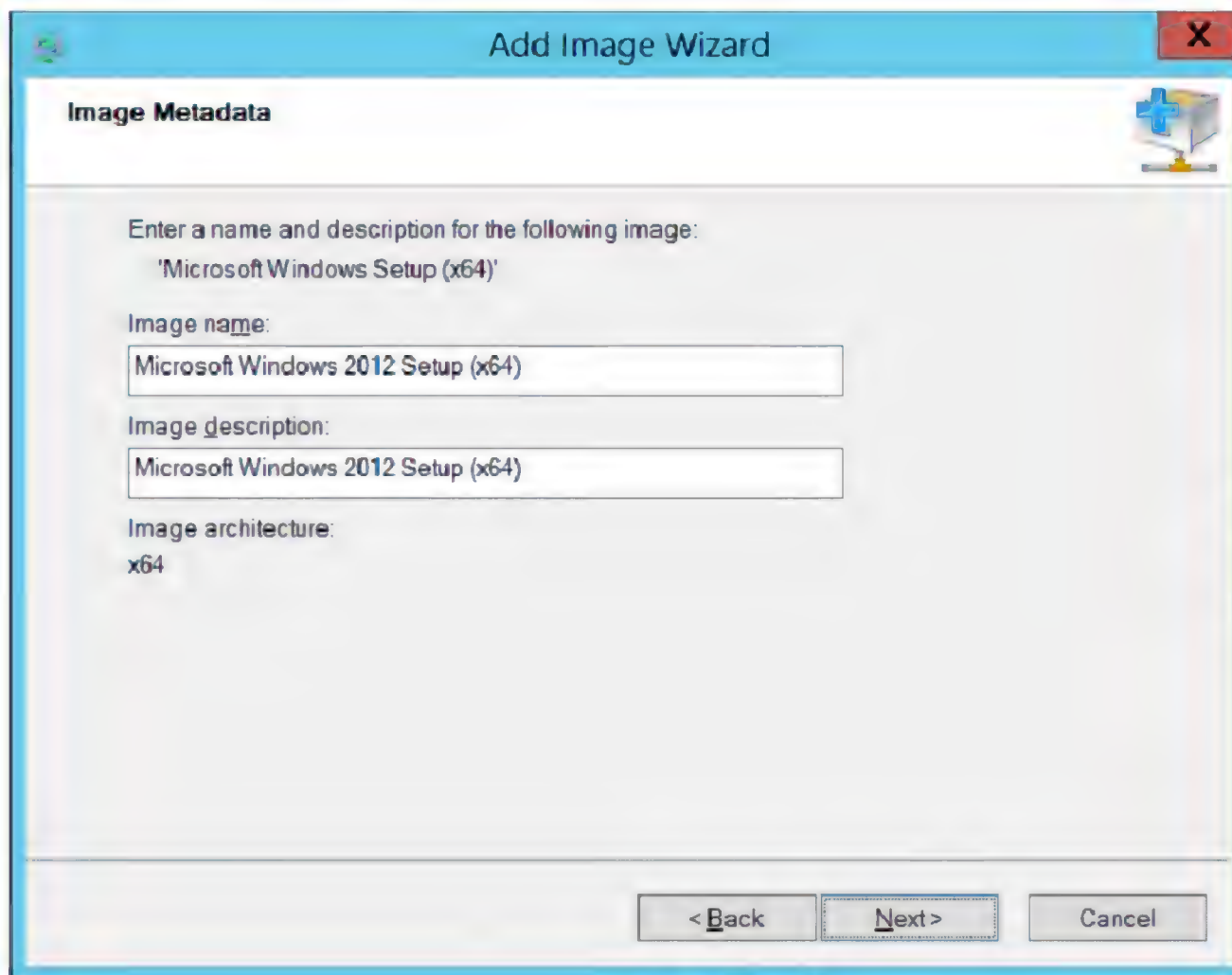
2. Browse and Select **boot.wim** file from 2012 OS DVD (Ex: D:\Sources\boot.wim)



3. Click **Next**.



4. Give Name to image Ex: **Windows Server 2012.**



The screenshot shows the 'Add Image Wizard' dialog box with the 'Image Metadata' tab selected. The dialog has a title bar with a close button (X). The main area contains the following text and input fields:

Enter a name and description for the following image:  
'Microsoft Windows Setup (x64)'

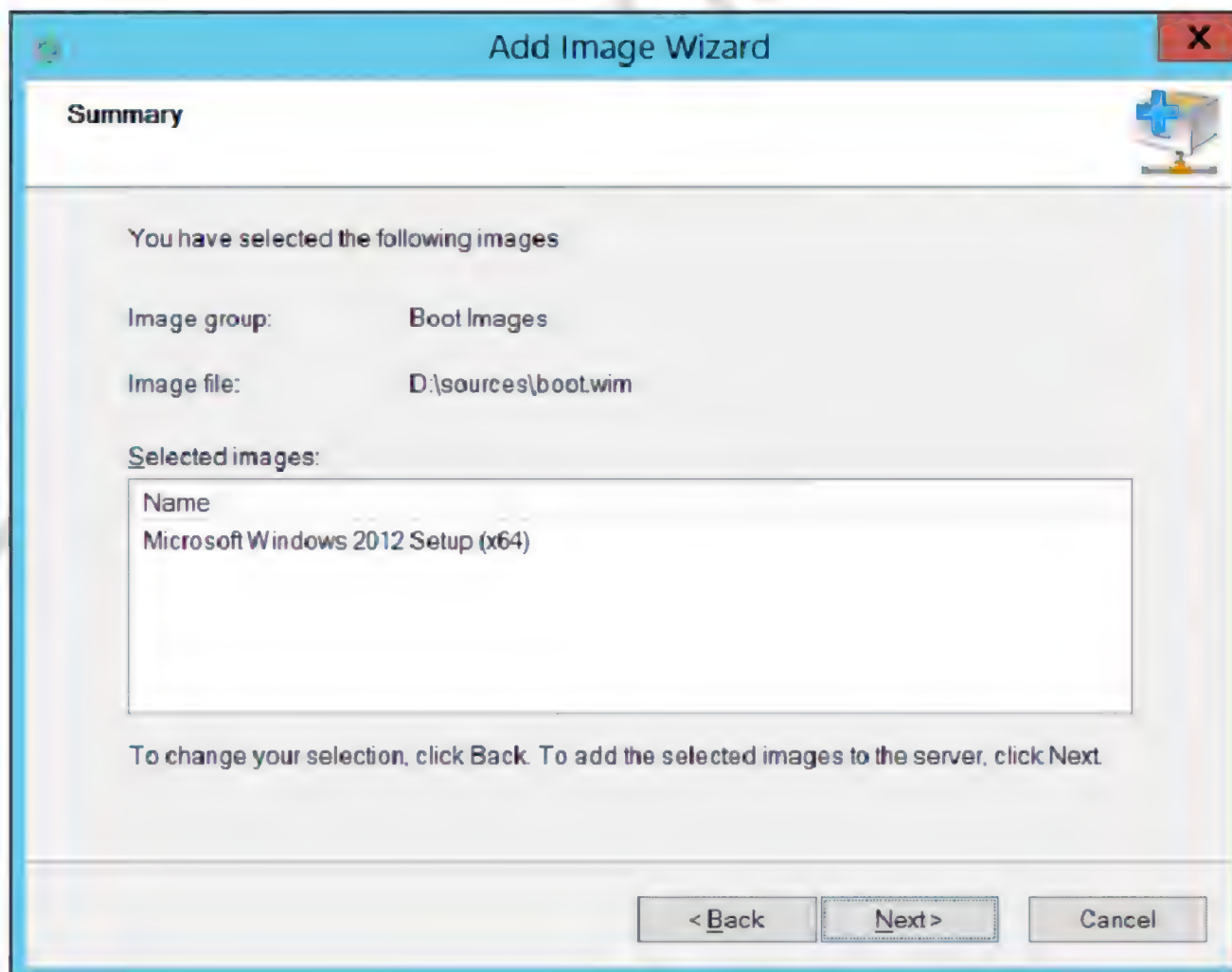
Image name:

Image description:

Image architecture:  
x64

At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

5. Click **Next**.



The screenshot shows the 'Add Image Wizard' dialog box with the 'Summary' tab selected. The dialog has a title bar with a close button (X). The main area contains the following text and input fields:

You have selected the following images

Image group: Boot Images

Image file: D:\sources\boot.wim

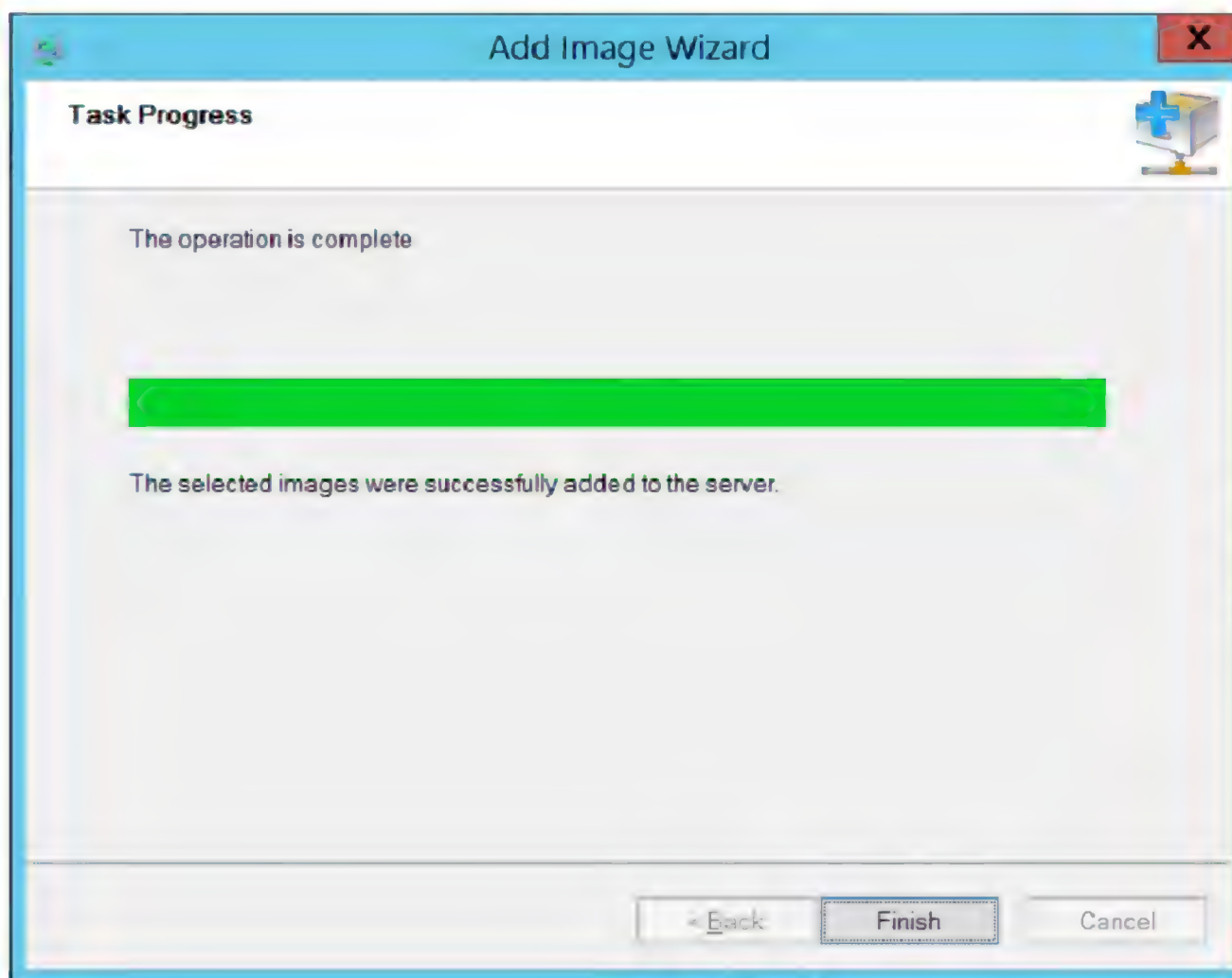
Selected images:

Name
Microsoft Windows 2012 Setup (x64)

At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

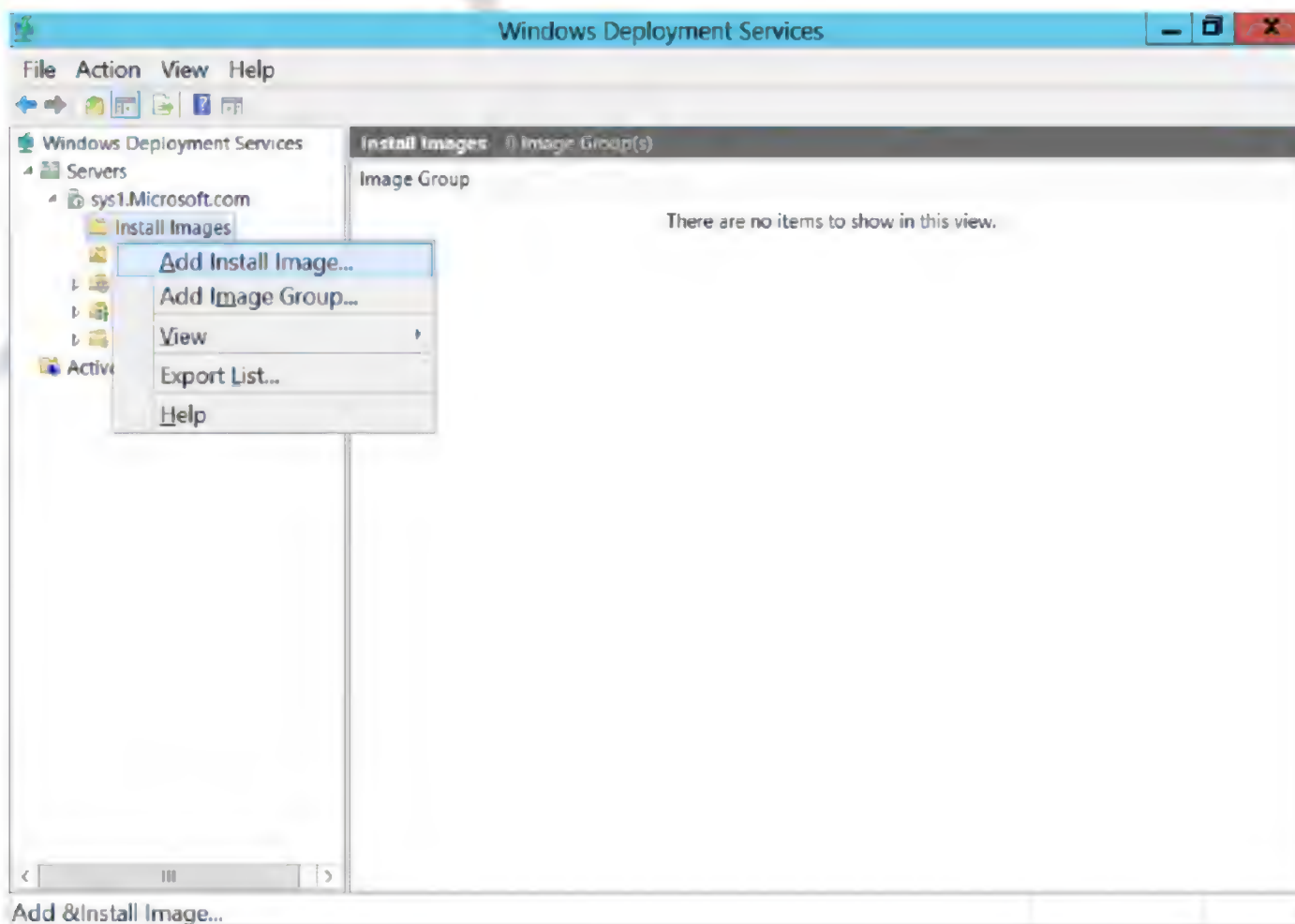


6. Image will be added → click **Finish**.

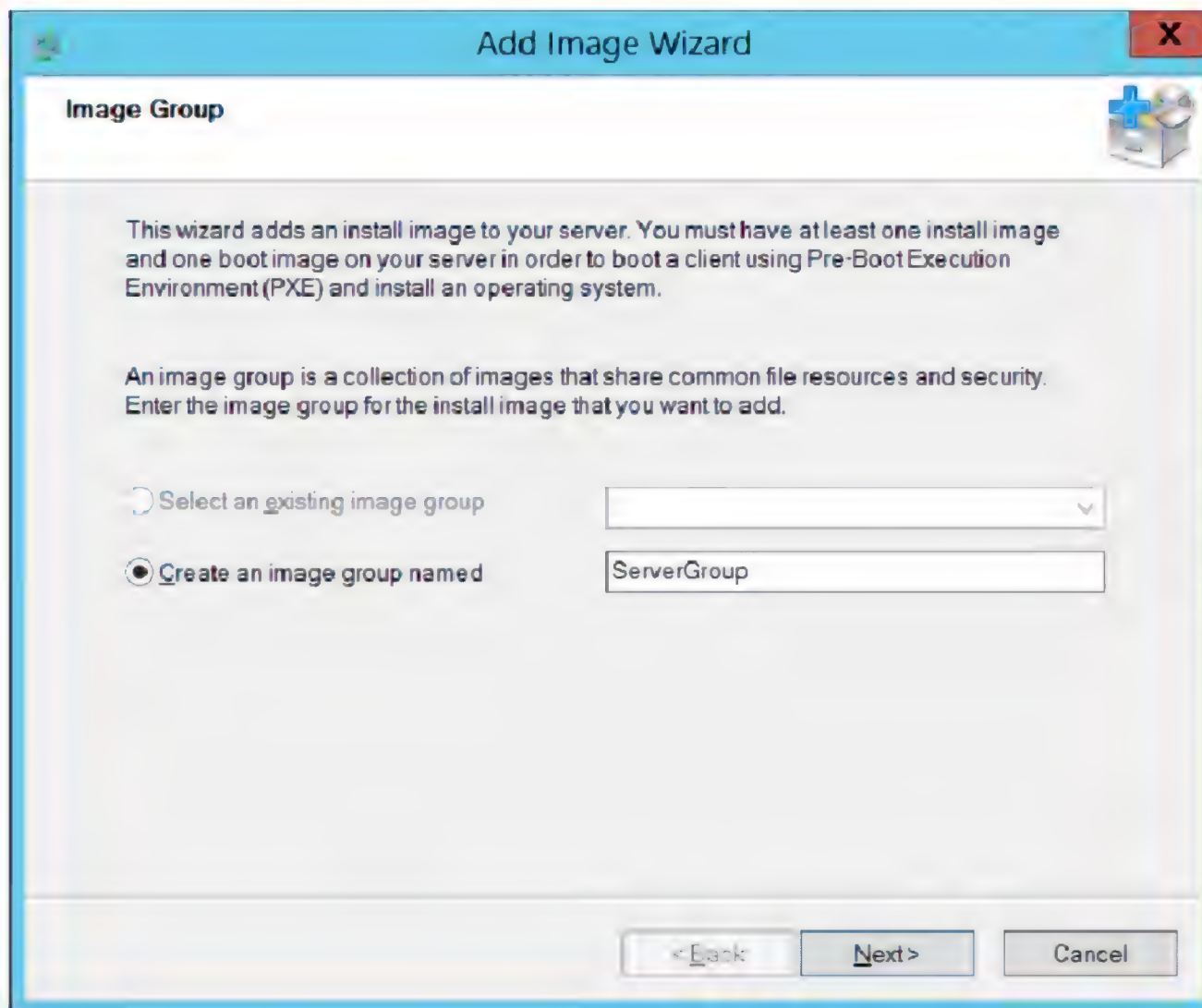


## Adding Windows2012 Install Image to WDS Server

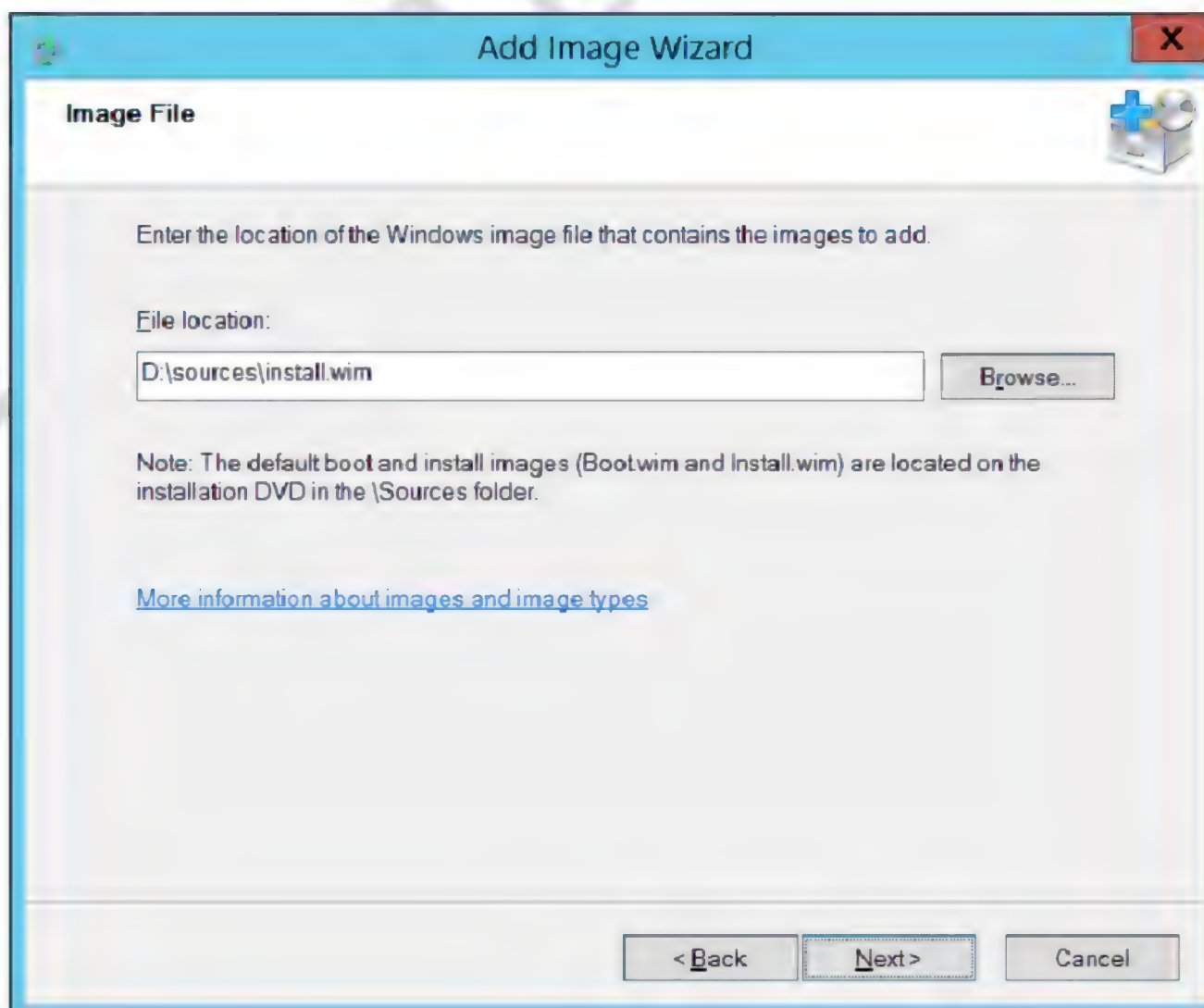
1. Right click Install Images Select **Add Install Image**.



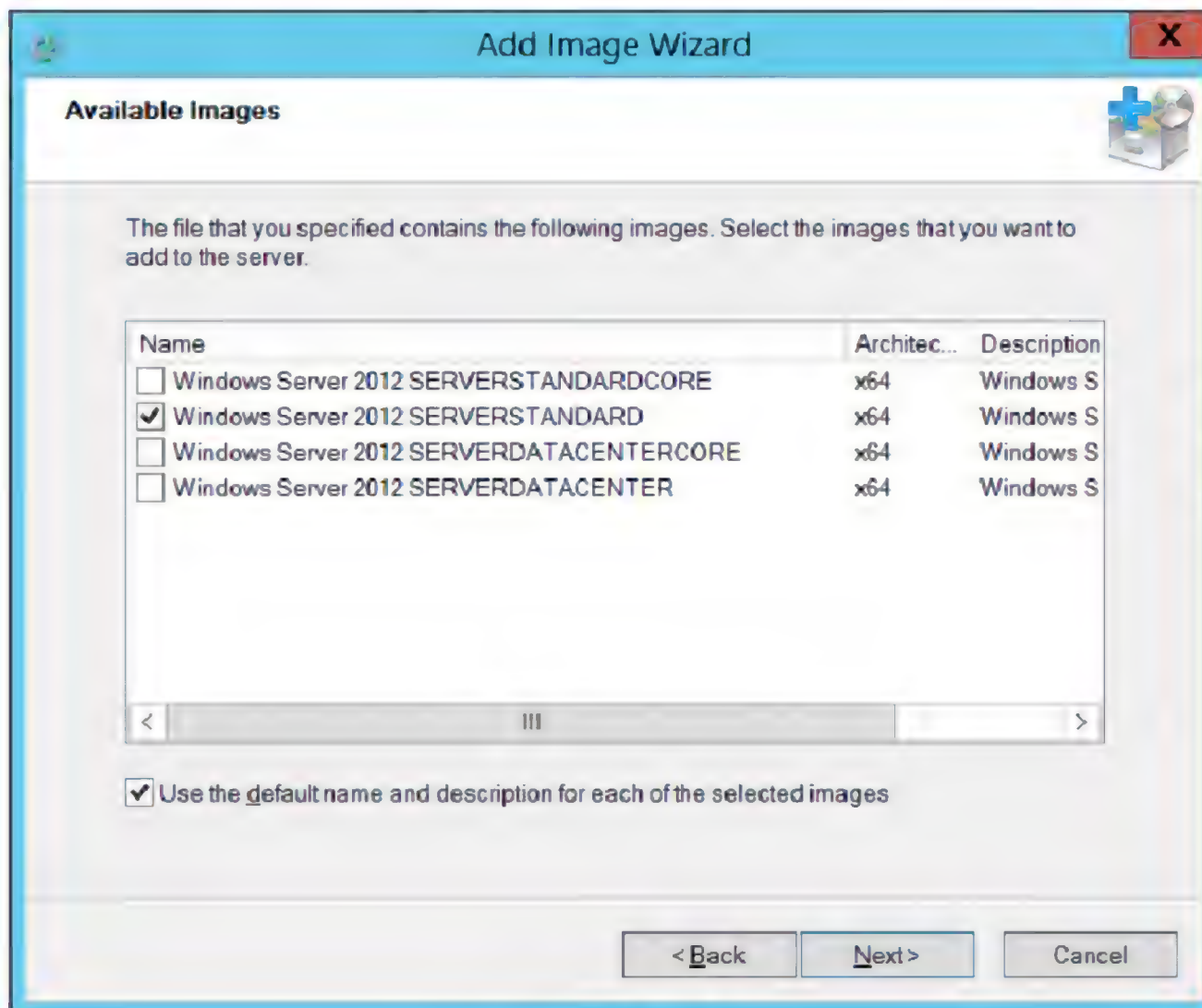
2. Give Name to Image Group Ex: **Server Group** and click **Next**.



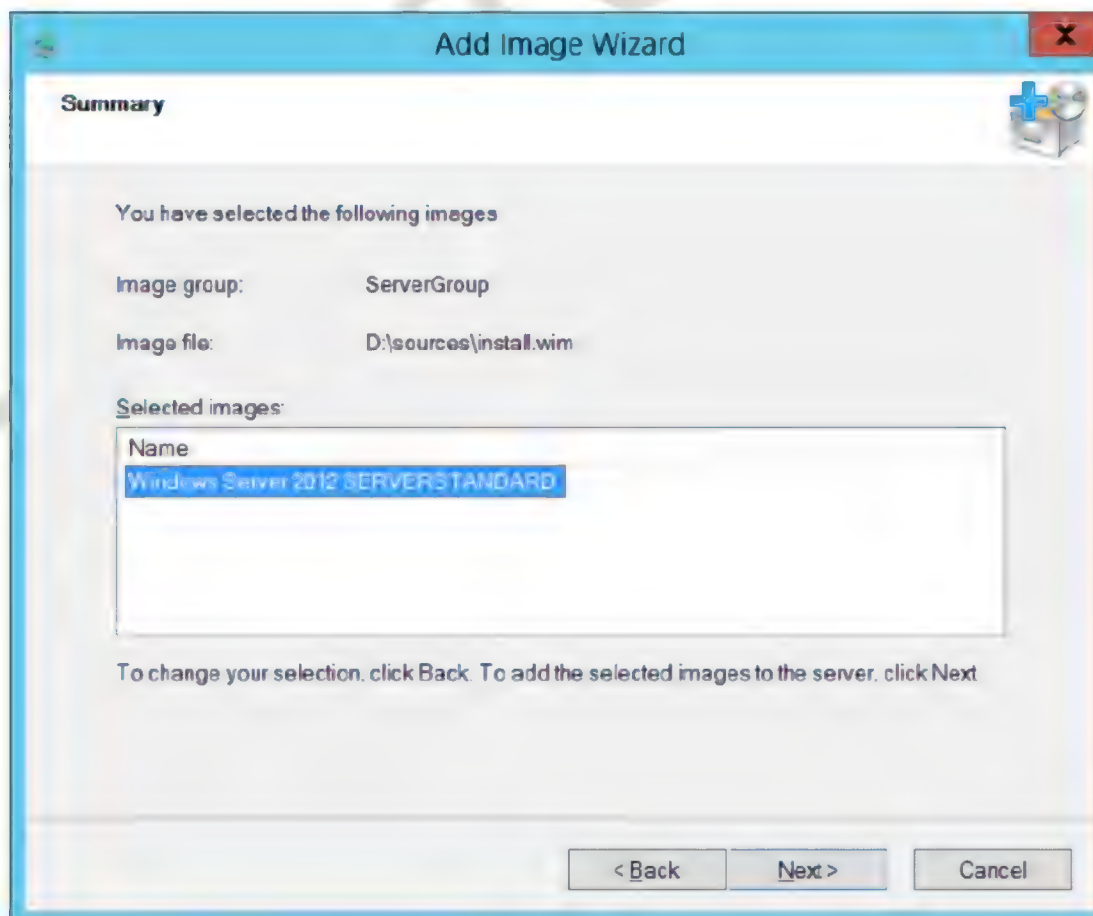
3. Browse and select **Install.wim** file from 2012 OS DVD (Ex: **D:\Sources\install.wim**) → click **Next**.



4. Select **Windows Server 2012 STANTARD** and click **Next**.

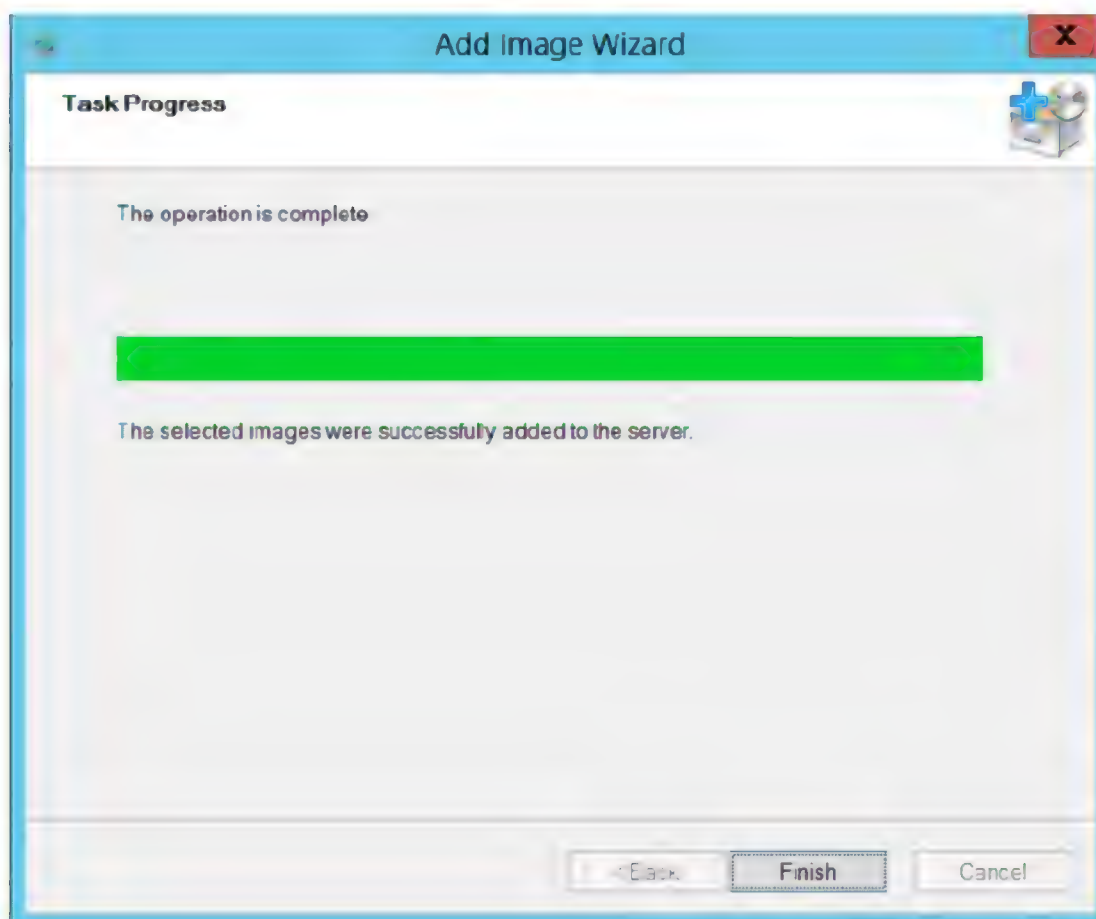


5. Click **Next**





6. Click **Finish**.



**Verification:**

1. Boot the **Client system** with **PXE NIC Card**
2. Press **F12 key** when prompted to start the **Installation**.
3. Then mention the **Administrator** Credential.
4. Select the Operating System which you want to install.
5. Select the Partition to install the O.S and follow the instructions

## Lab – 64: Installing and Configuring HYPER – V

**Objective:**

To Configure Virtualization using Hyper-V

**Pre-requisites:**

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System Hyper-V host.

**Topology:****SYS1****Domain Controller**

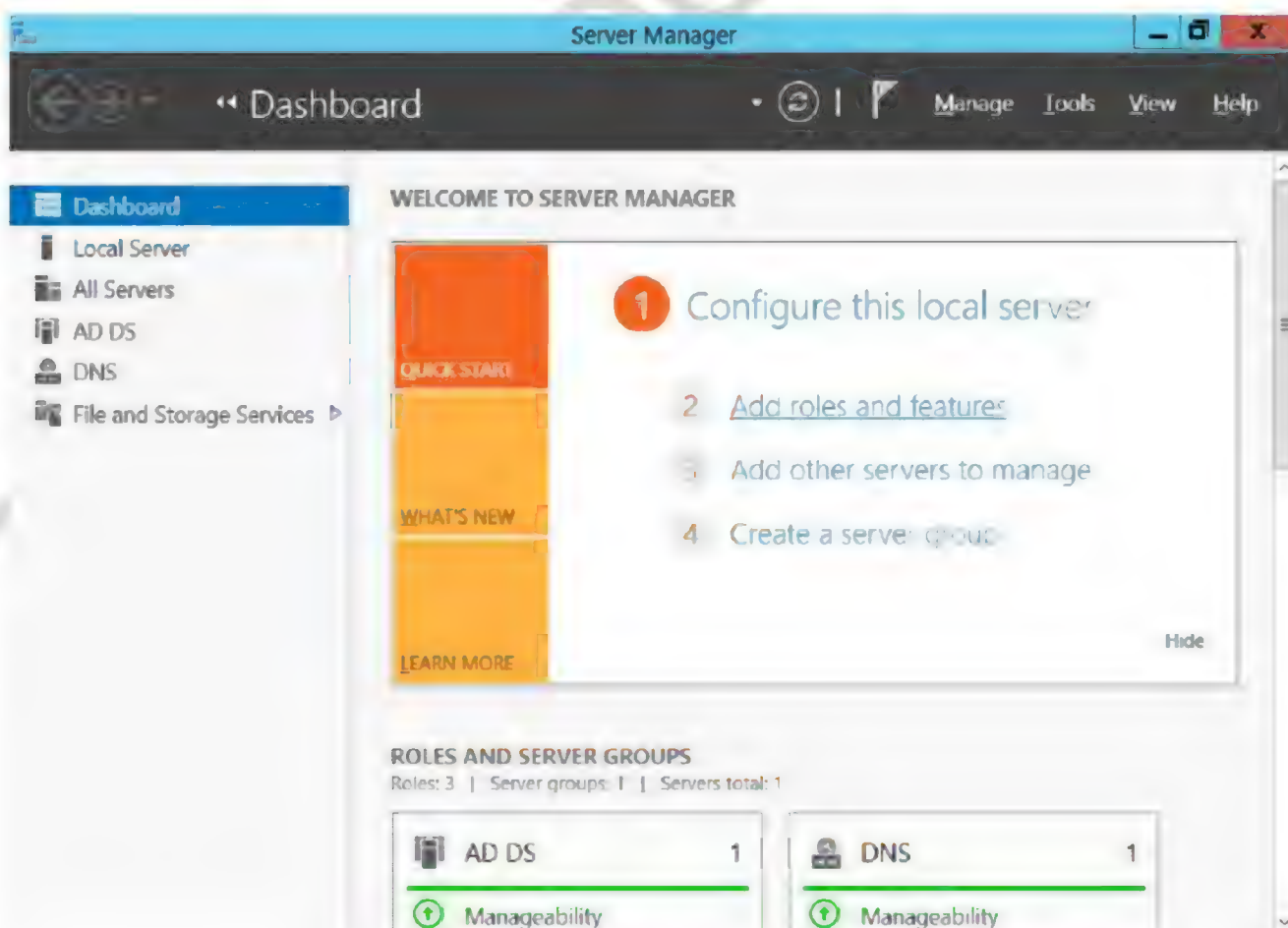
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Click **Server Manager**.

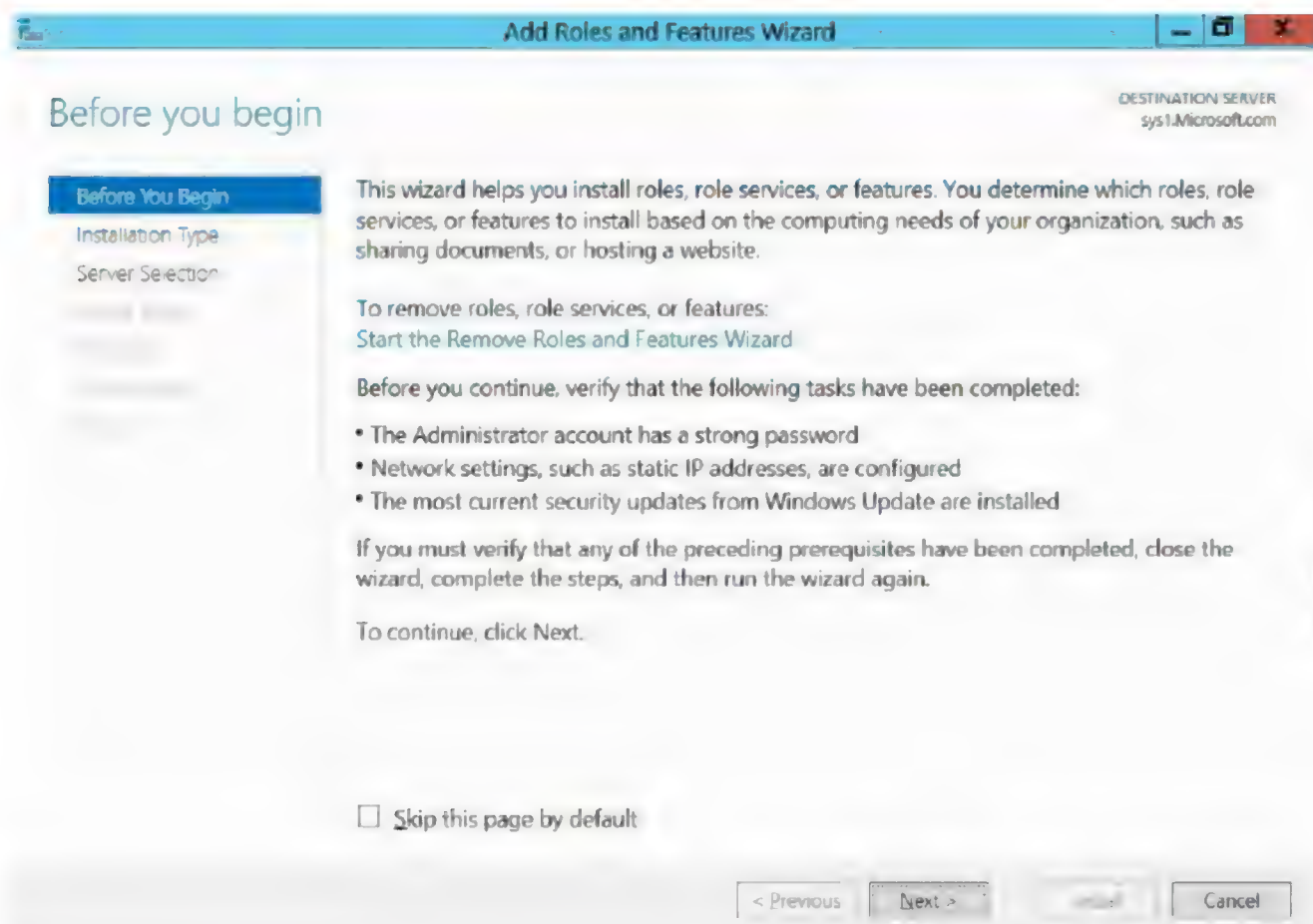


2. In Server Manager Dashboard, Click **Add roles and features**.

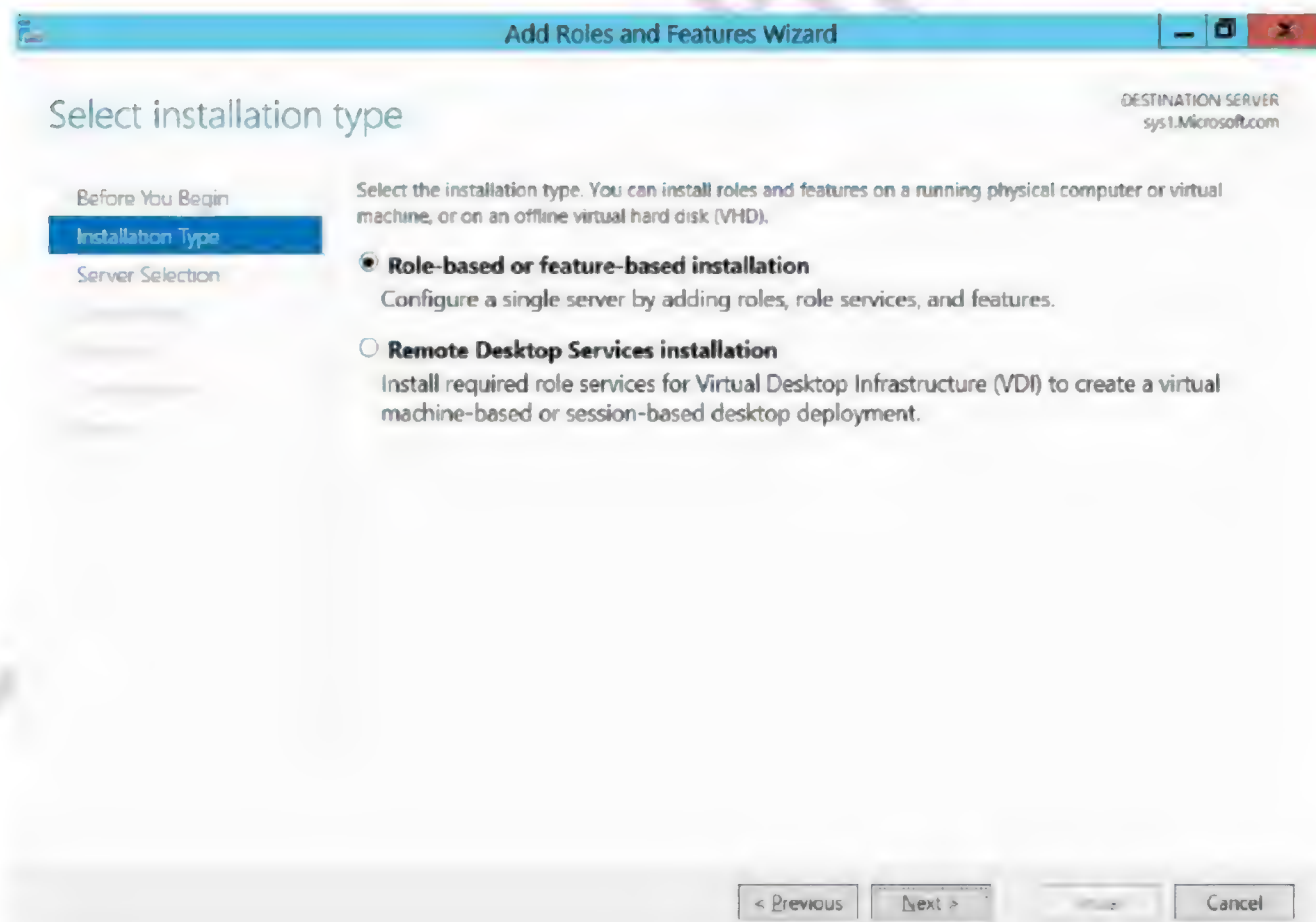




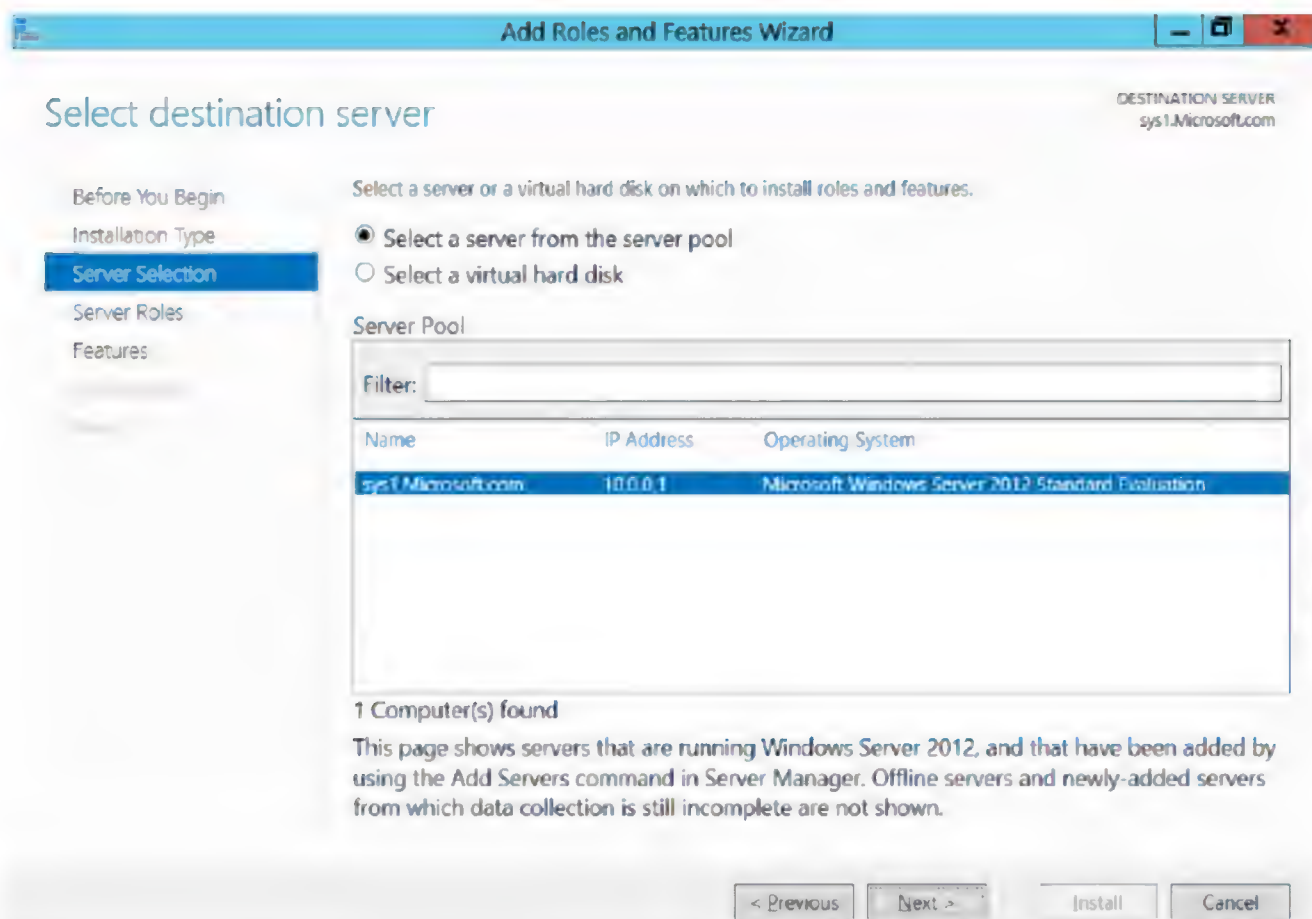
3. In Before you begin page, click **Next**.



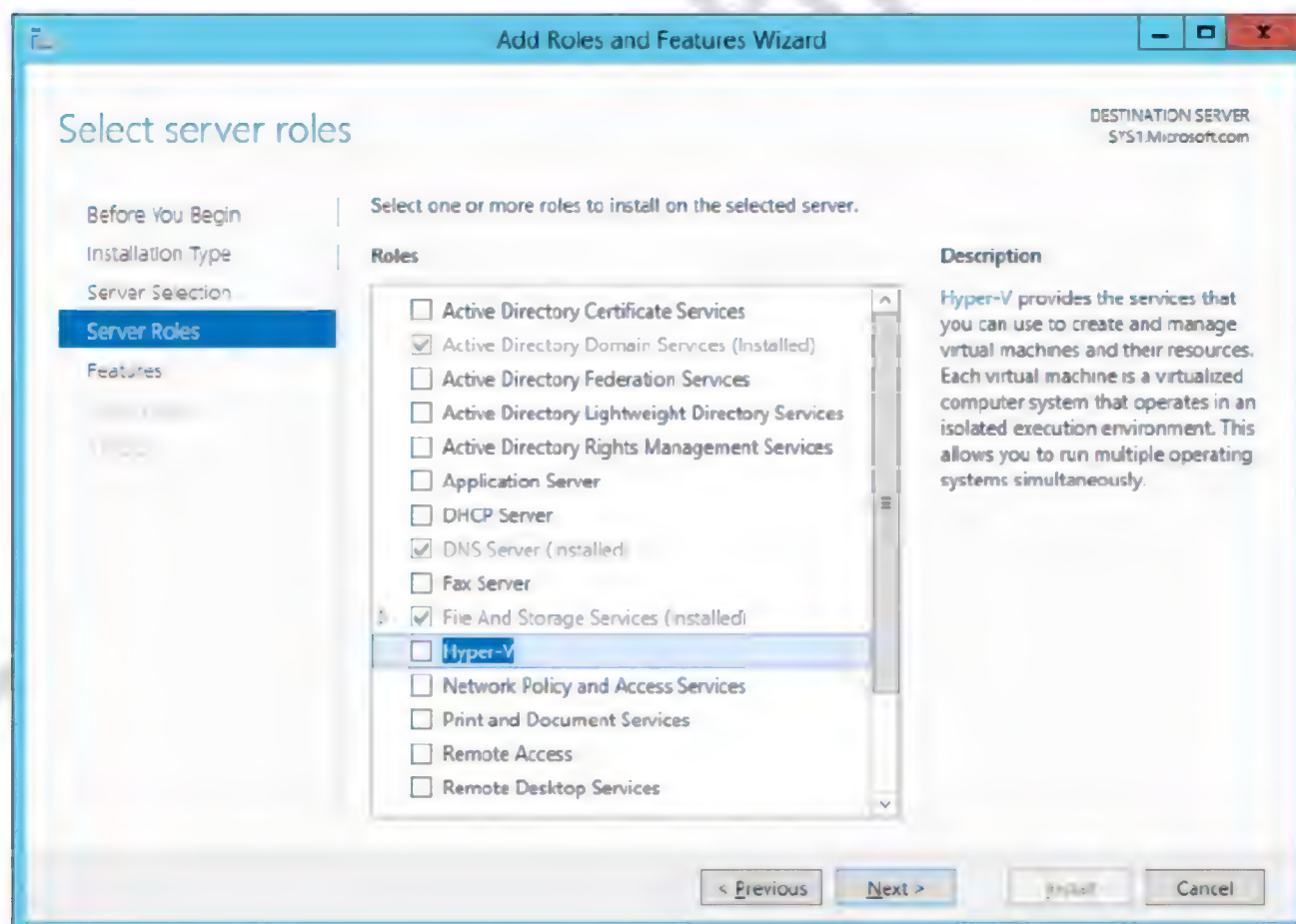
4. In Select installation type, select **Role-based or feature-based installation**, click **Next**.



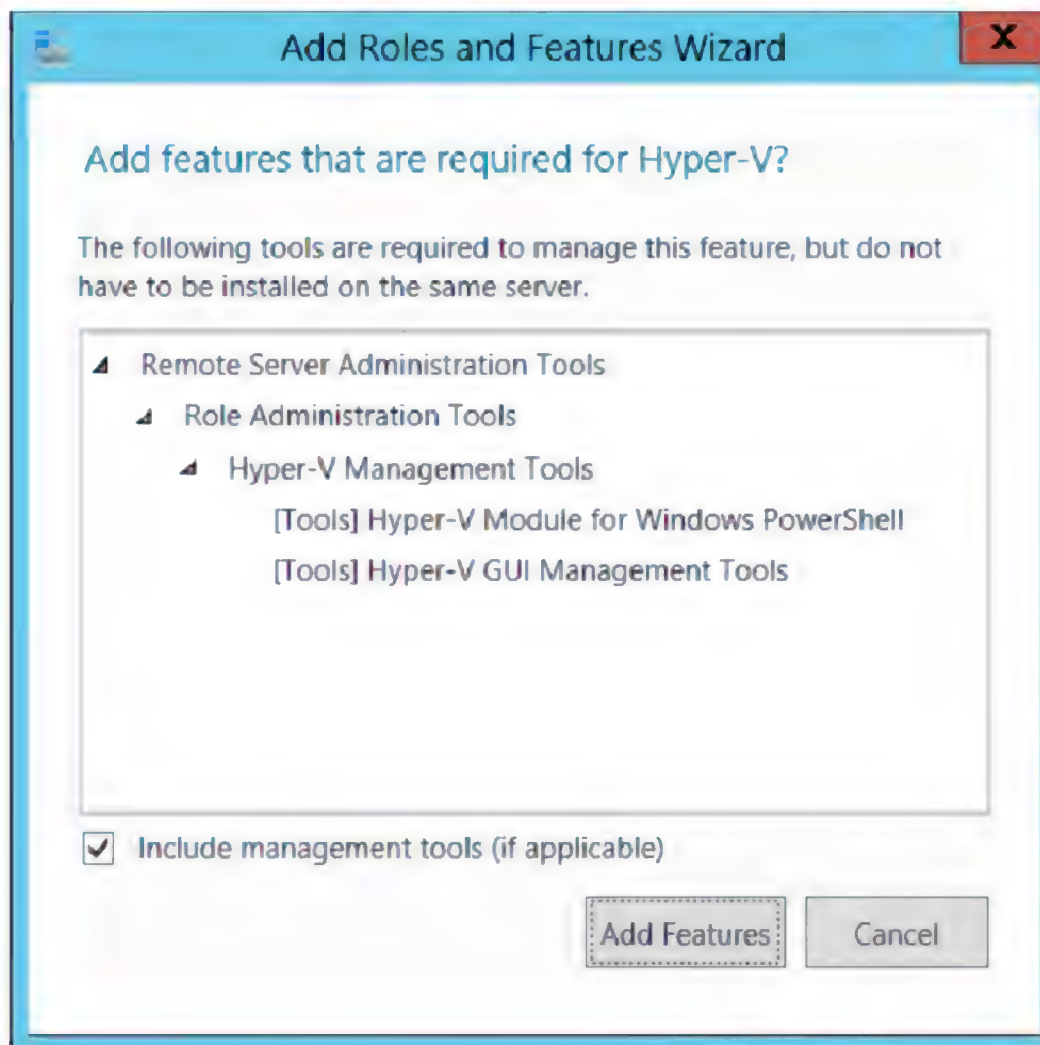
5. In Select destination server, from Server Pool select **SYS1.Microsoft.com**, click **Next**.



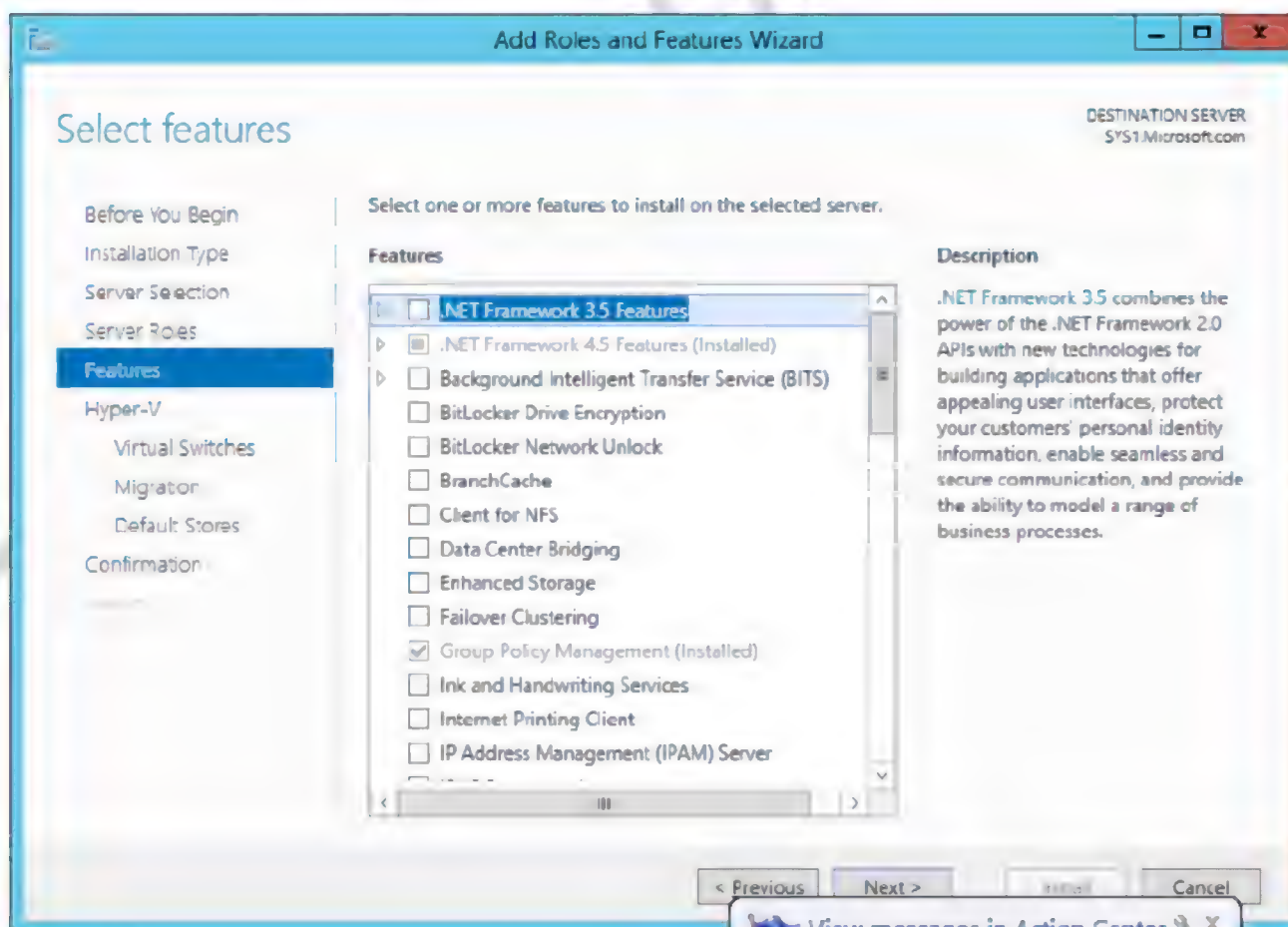
6. In Roles, check the box **Hyper-V**.



7. Click **Add Features**, to install the required features for Hyper-V. Click **Next**.

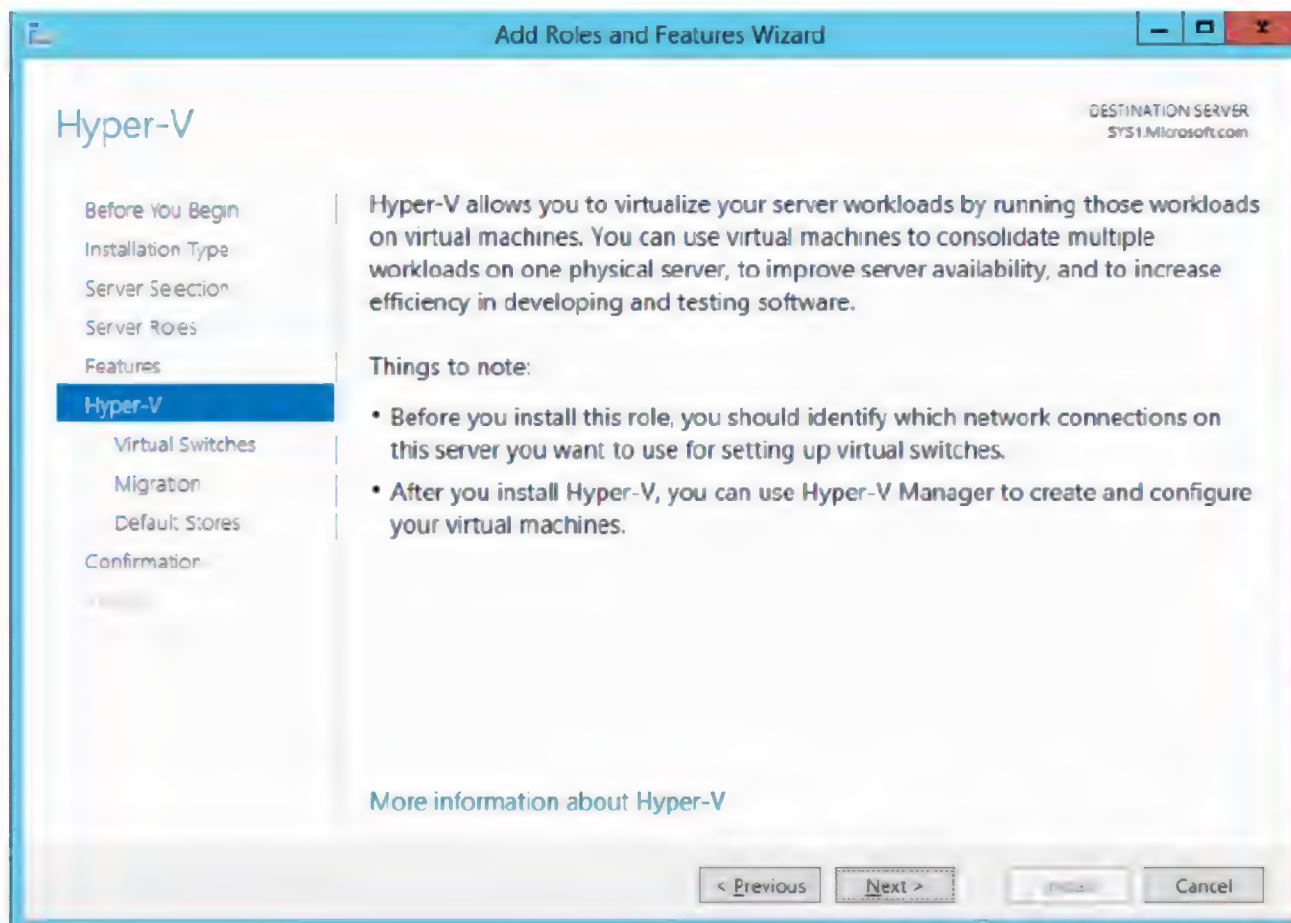


8. In Select features wizard, click **Next**.

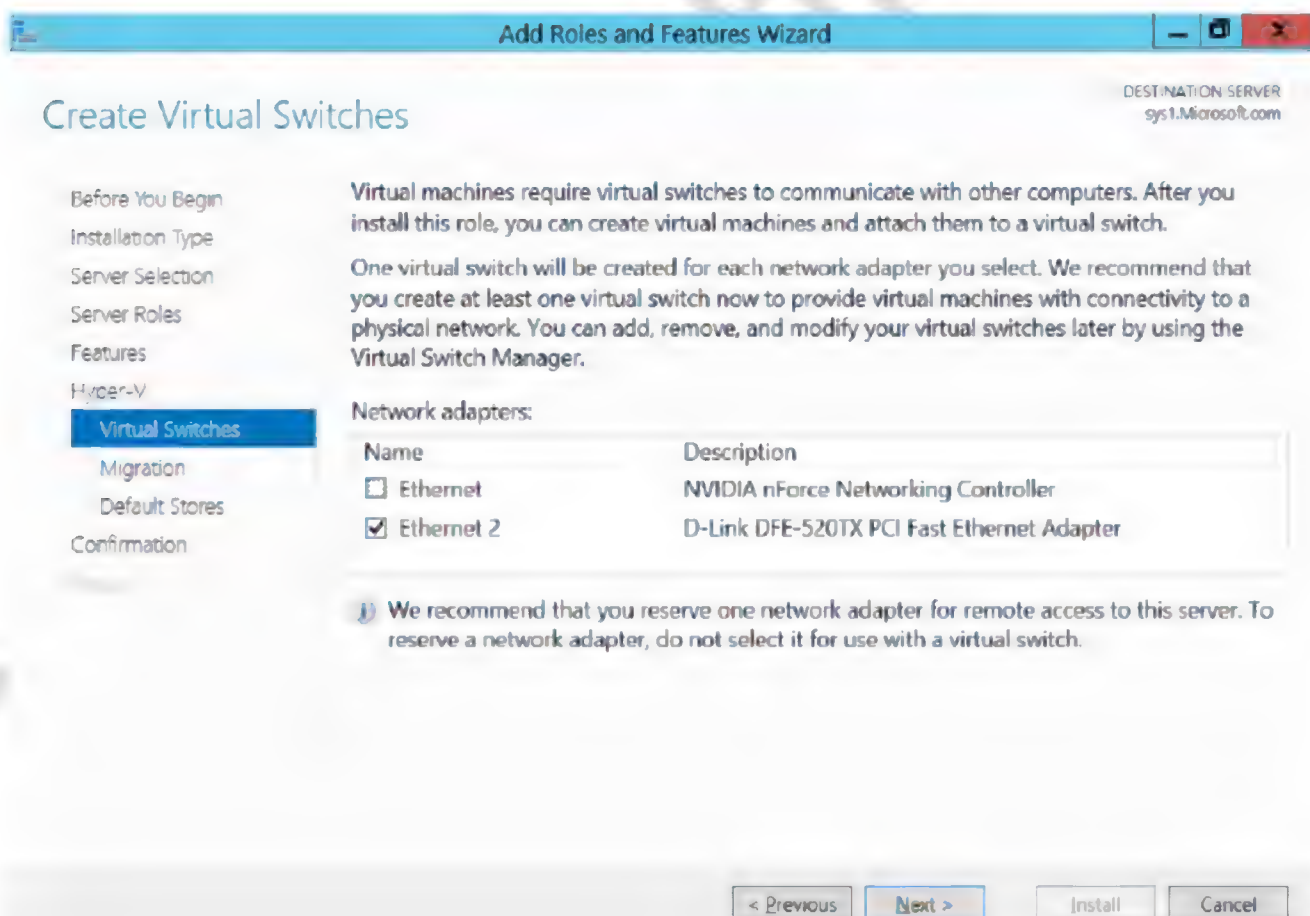




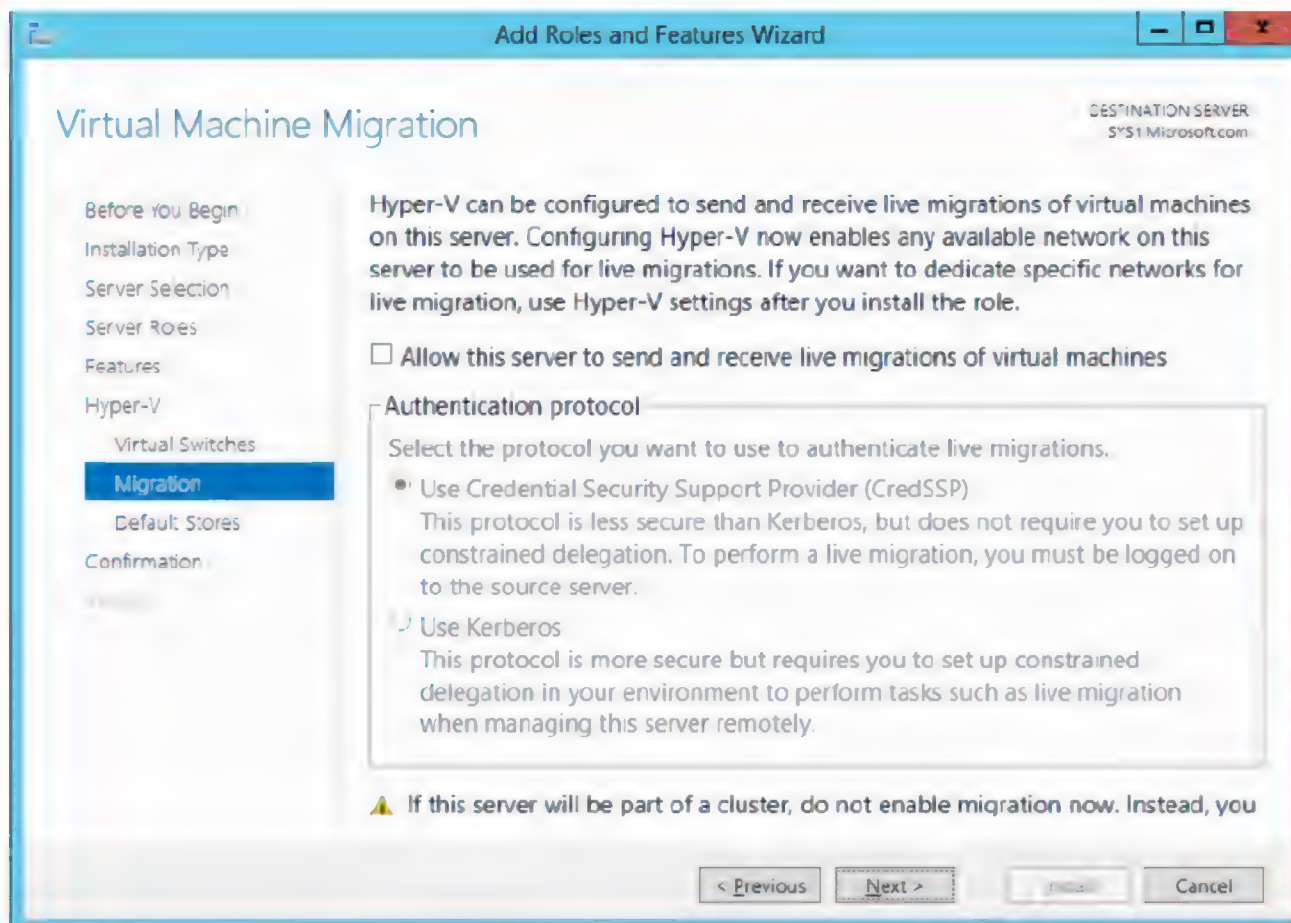
9. In Hyper-V wizard, click **Next**.



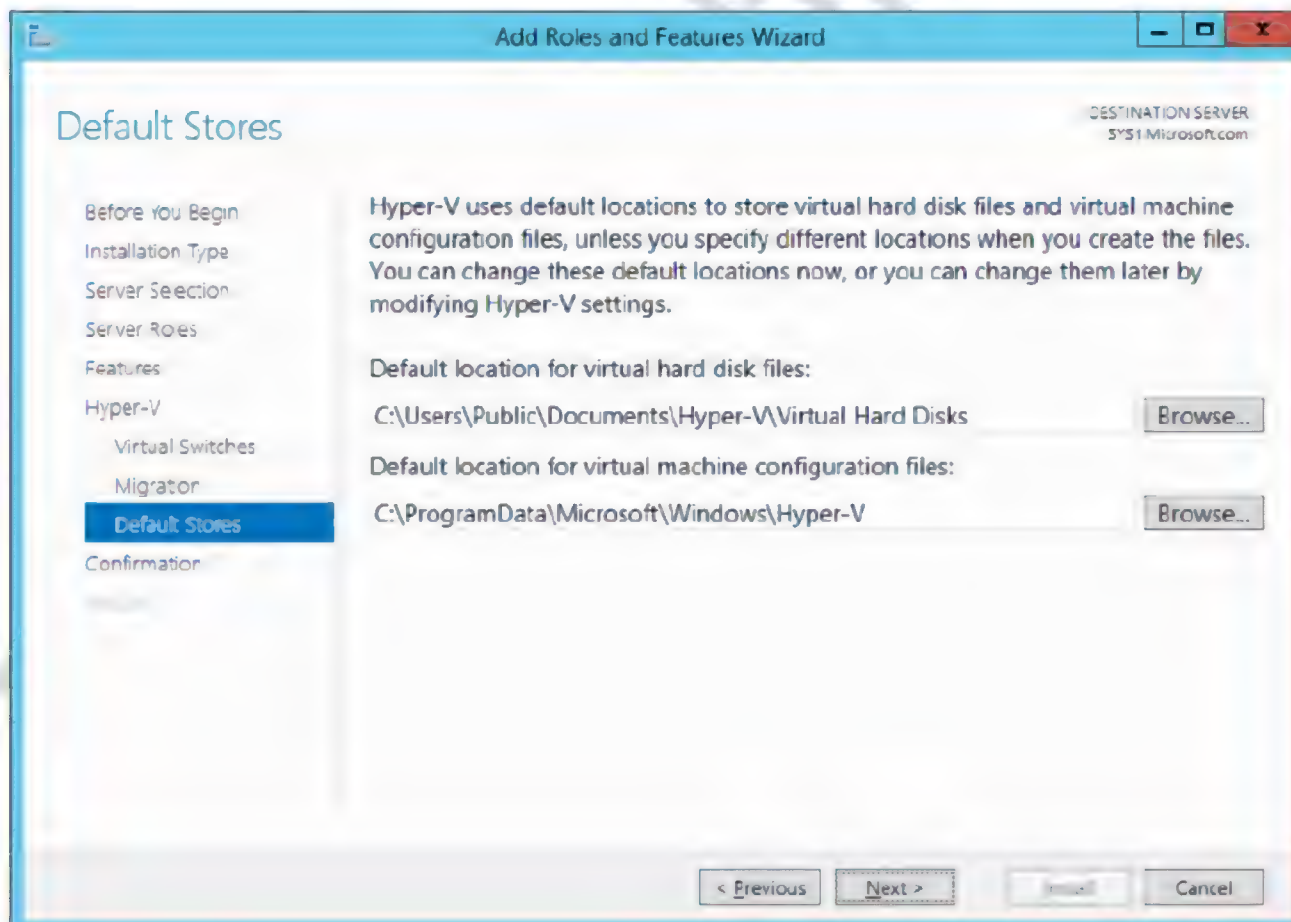
10. Check the box **Ethernet 2** to work as Virtual Switch. Click **Next**.



11. In Virtual Machine Migration Page, click **Next**.

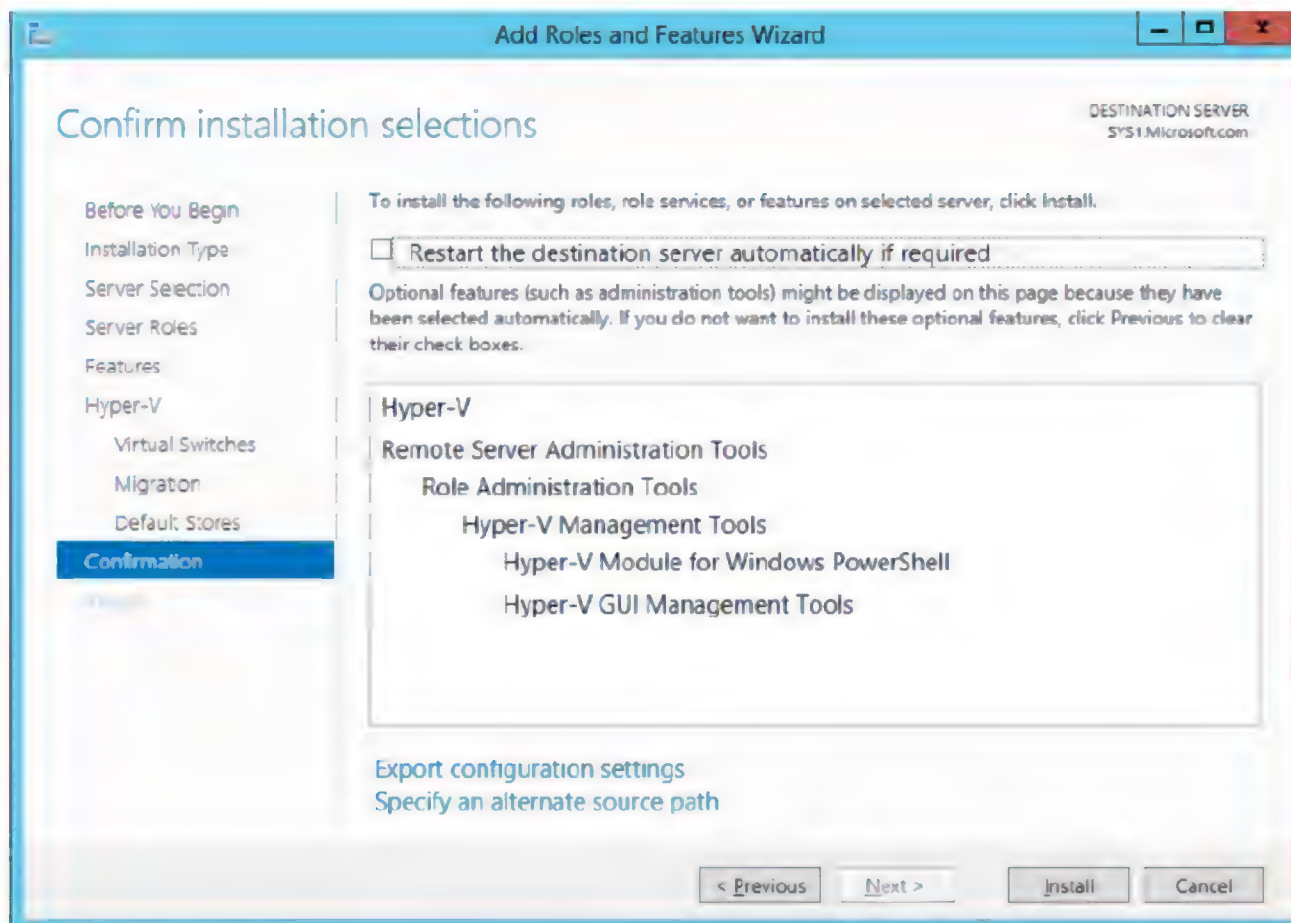


12. In Default Stores Page, click **Next**.

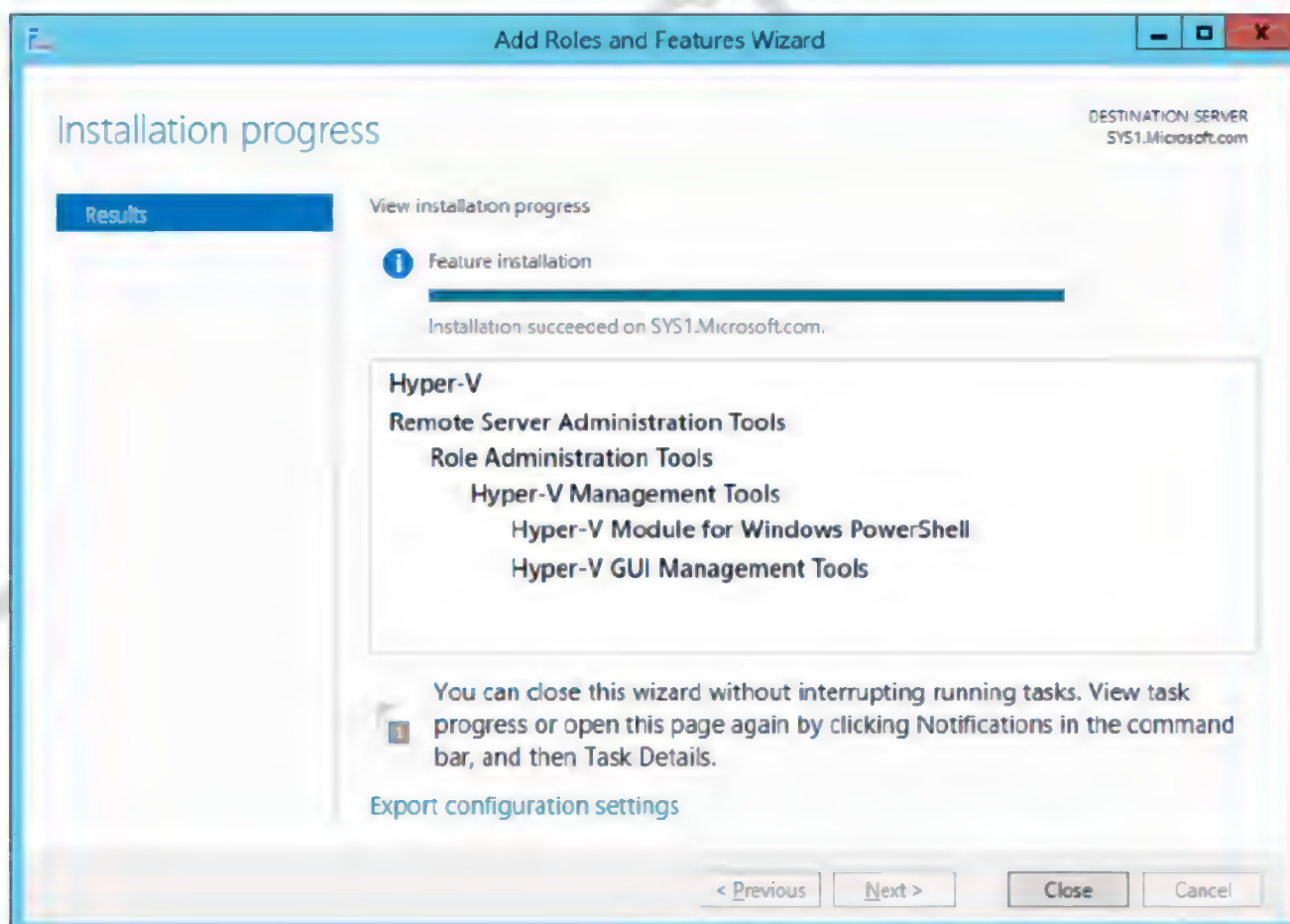




13. Check box Restart the destination server automatically if required, click **Install**.



14. Computer Restarts and completes the installation of Hyper-V Role.
15. Click **Close**.





## Lab – 65: Creating Virtual Machine on Hyper-V

**Objective:**

To create virtual machine using Hyper-V

**Pre-requisites:**

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System Hyper-V host.

**Topology:****SYS1****Domain Controller**

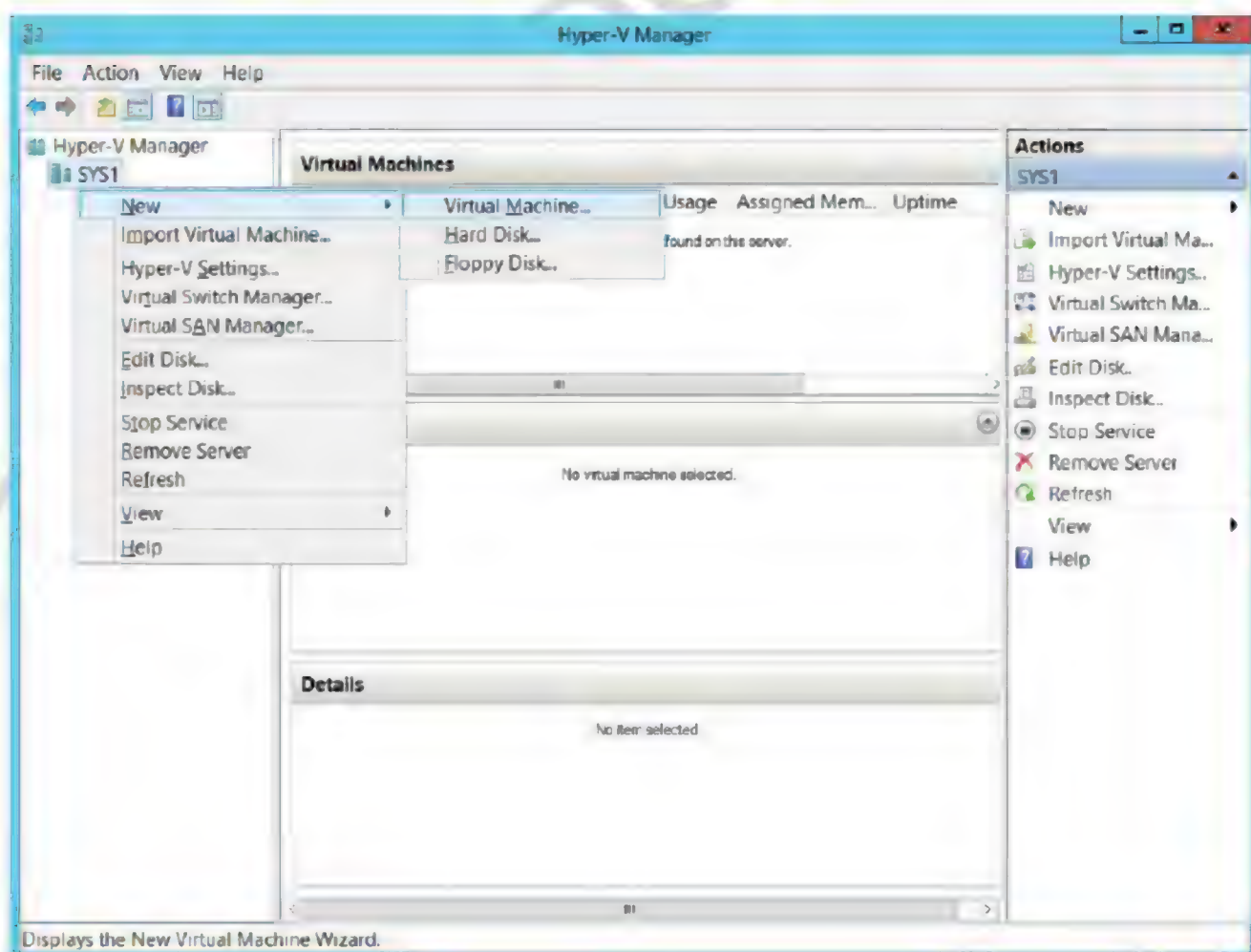
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

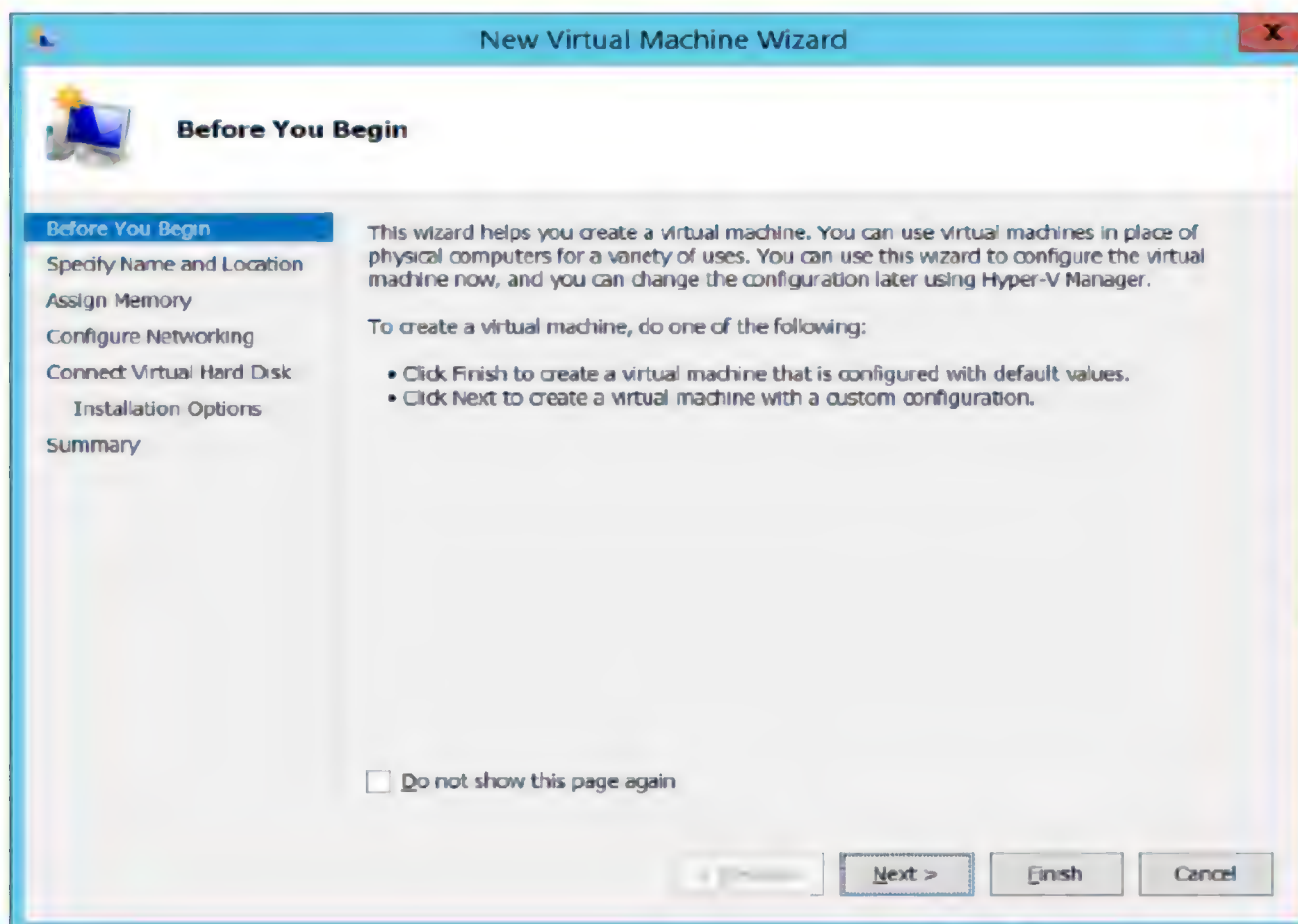
1. Go to Start, select **Hyper-V Manager**.



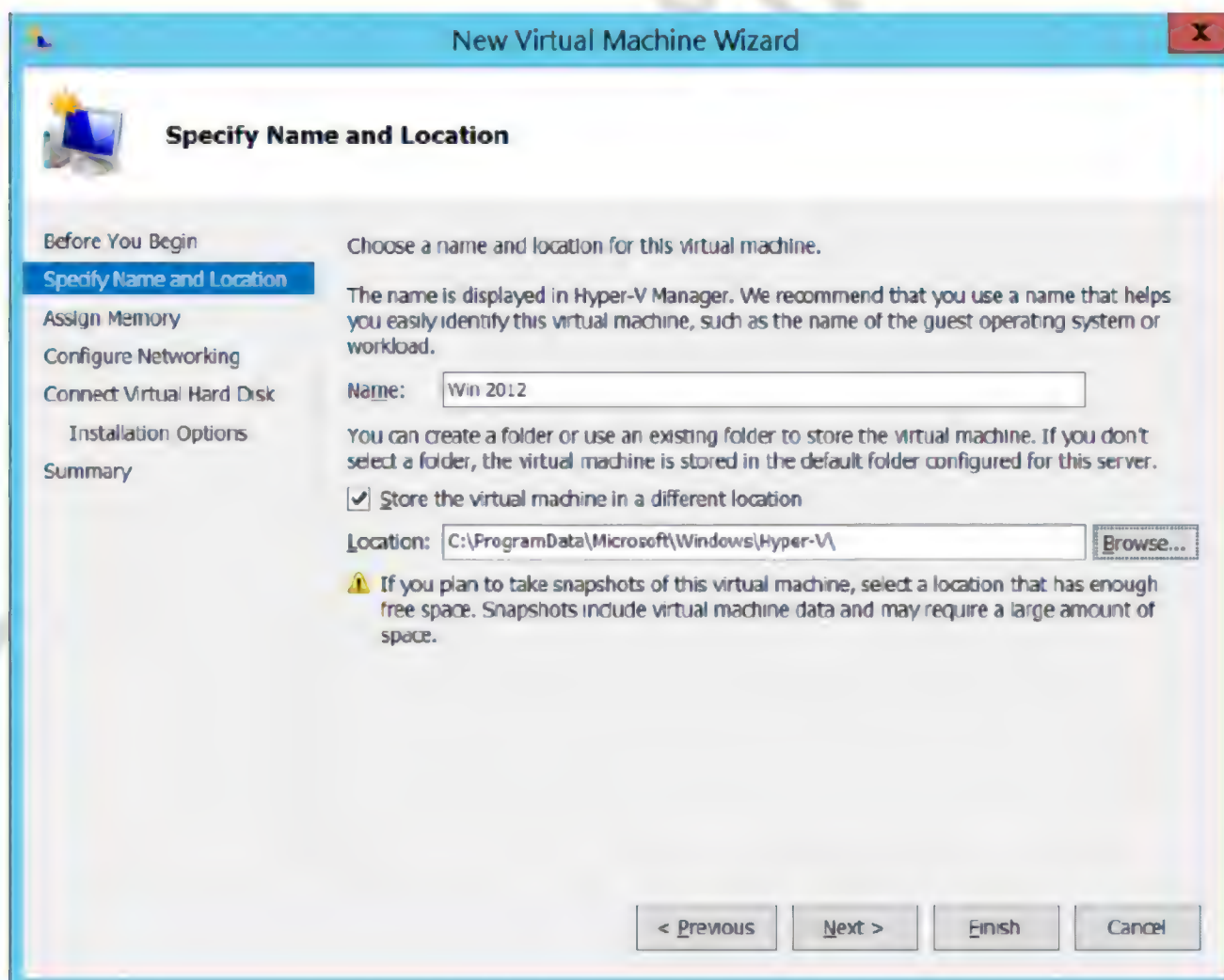
2. In Hyper-V Manager, right click on Server Name (**SYS1**) and select **New Virtual Machine**.



3. In Before you begin page, click **Next**.

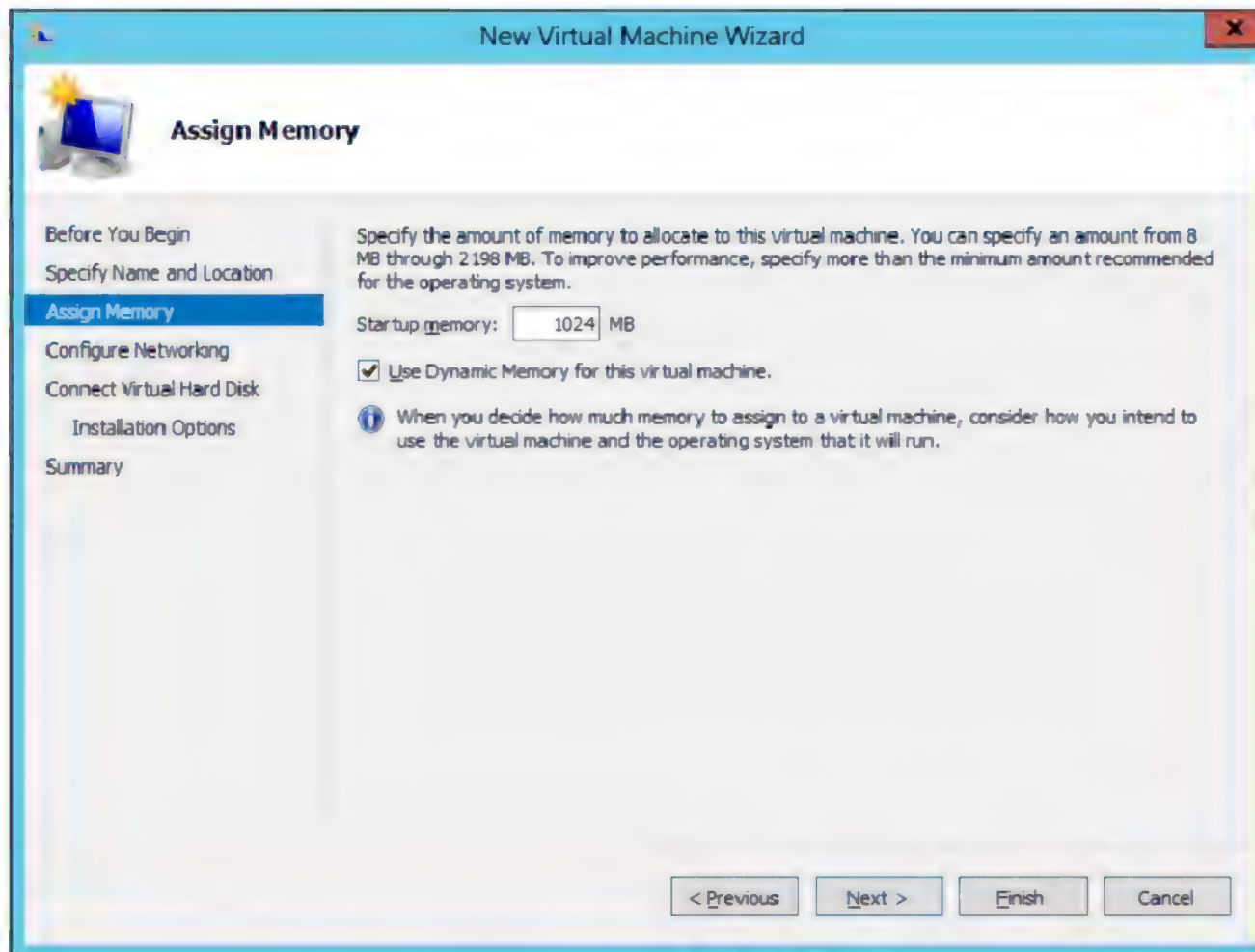


4. Enter Name and Location for the Virtual Machine (Ex: Win 2012) and click **Next**.

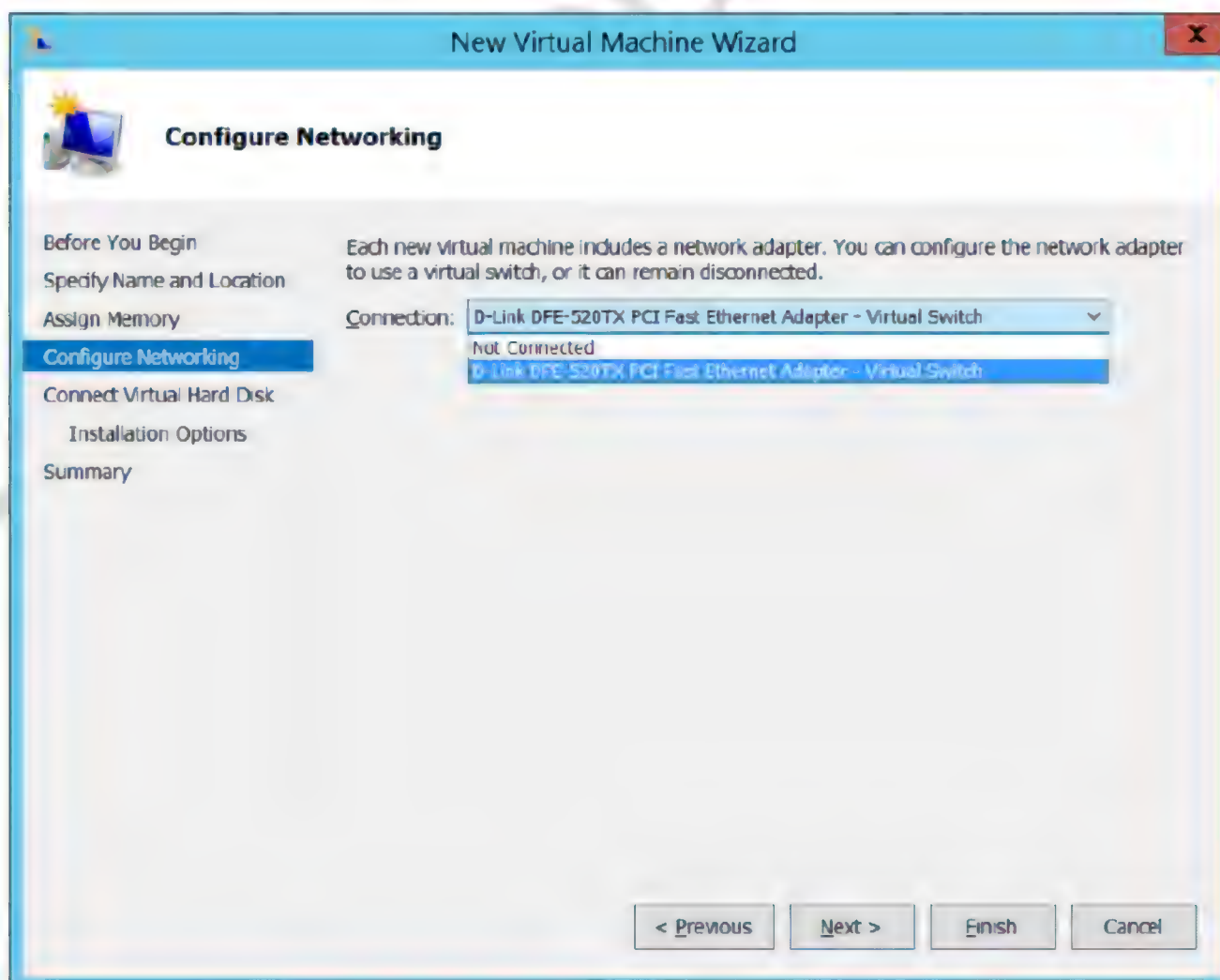




5. In Assign Memory Page, Enter the amount of RAM for the virtual machine (Ex: 1024 MB) and select Use Dynamic Memory for this virtual machine.



6. In Configure Networking Page, select Virtual Switch Adapter click **Next**.



7. In Connect Virtual Hard Disk Page, select **Create a virtual hard disk** and enter the **Name**, **Location** and **Size** of the virtual hard disk. Click **Next**.

The screenshot shows the 'Connect Virtual Hard Disk' step of the 'New Virtual Machine Wizard'. The left sidebar lists the steps: 'Before You Begin', 'Specify Name and Location', 'Assign Memory', 'Configure Networking', 'Connect Virtual Hard Disk' (highlighted), 'Installation Options', and 'Summary'. The main area contains the following text: 'A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.' There are three radio button options: 
 

- Create a virtual hard disk** (selected): 'Use this option to create a dynamically expanding virtual hard disk with the default format (VHDX)'. Below this are fields for 'Name' (Win 2012.vhdx), 'Location' (C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\), and 'Size' (127 GB (Maximum: 64 TB)).
- Use an existing virtual hard disk**: 'Use this option to attach an existing virtual hard disk, either VHD or VHDX format.' Below this is a 'Location' field (C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\).
- Attach a virtual hard disk later**: 'Use this option to skip this step now and attach an existing virtual hard disk later.'

 At the bottom are buttons for '< Previous', 'Next >', 'Finish', and 'Cancel'.

8. In Installation Options, select **Install an operating system from a boot CD/DVD-ROM**, click **Next**.

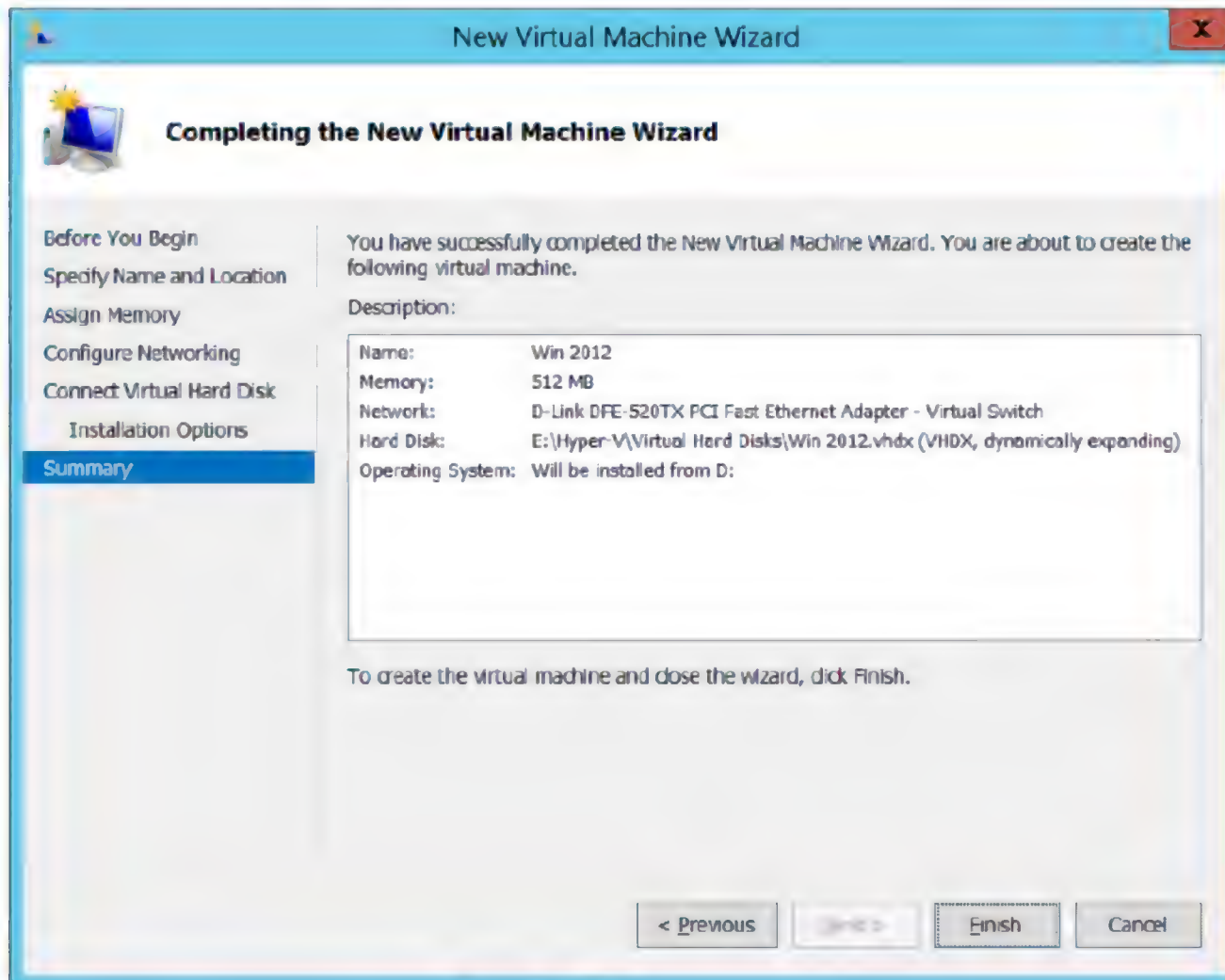
The screenshot shows the 'Installation Options' step of the 'New Virtual Machine Wizard'. The left sidebar lists the steps: 'Before You Begin', 'Specify Name and Location', 'Assign Memory', 'Configure Networking', 'Connect Virtual Hard Disk', 'Installation Options' (highlighted), and 'Summary'. The main area contains the following text: 'You can install an operating system now if you have access to the setup media, or you can install it later.' There are four radio button options:
 

- Install an operating system later**
- Install an operating system from a boot CD/DVD-ROM** (selected): Under 'Media', there are two sub-options:
  - Physical CD/DVD drive**: A dropdown menu showing 'D:'.
  - Image file (.iso)**: A text box with a 'Browse...' button.
- Install an operating system from a boot floppy disk**: Under 'Media', there is a 'Virtual floppy disk (.vfc)' text box with a 'Browse...' button.
- Install an operating system from a network-based installation server**

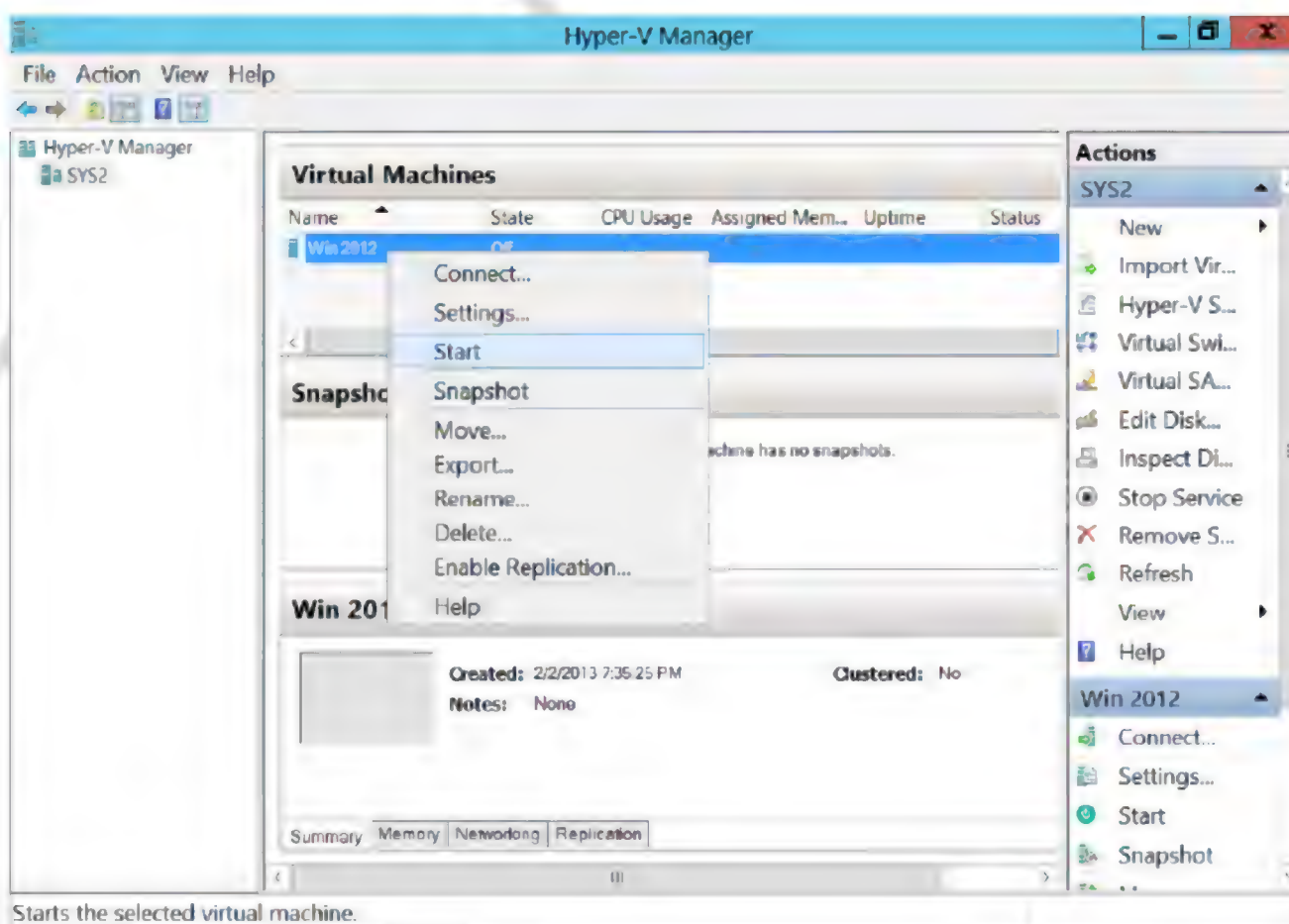
 At the bottom are buttons for '< Previous', 'Next >', 'Finish', and 'Cancel'.



9. In Completing the New Virtual Machine Wizard, click **Finish**.

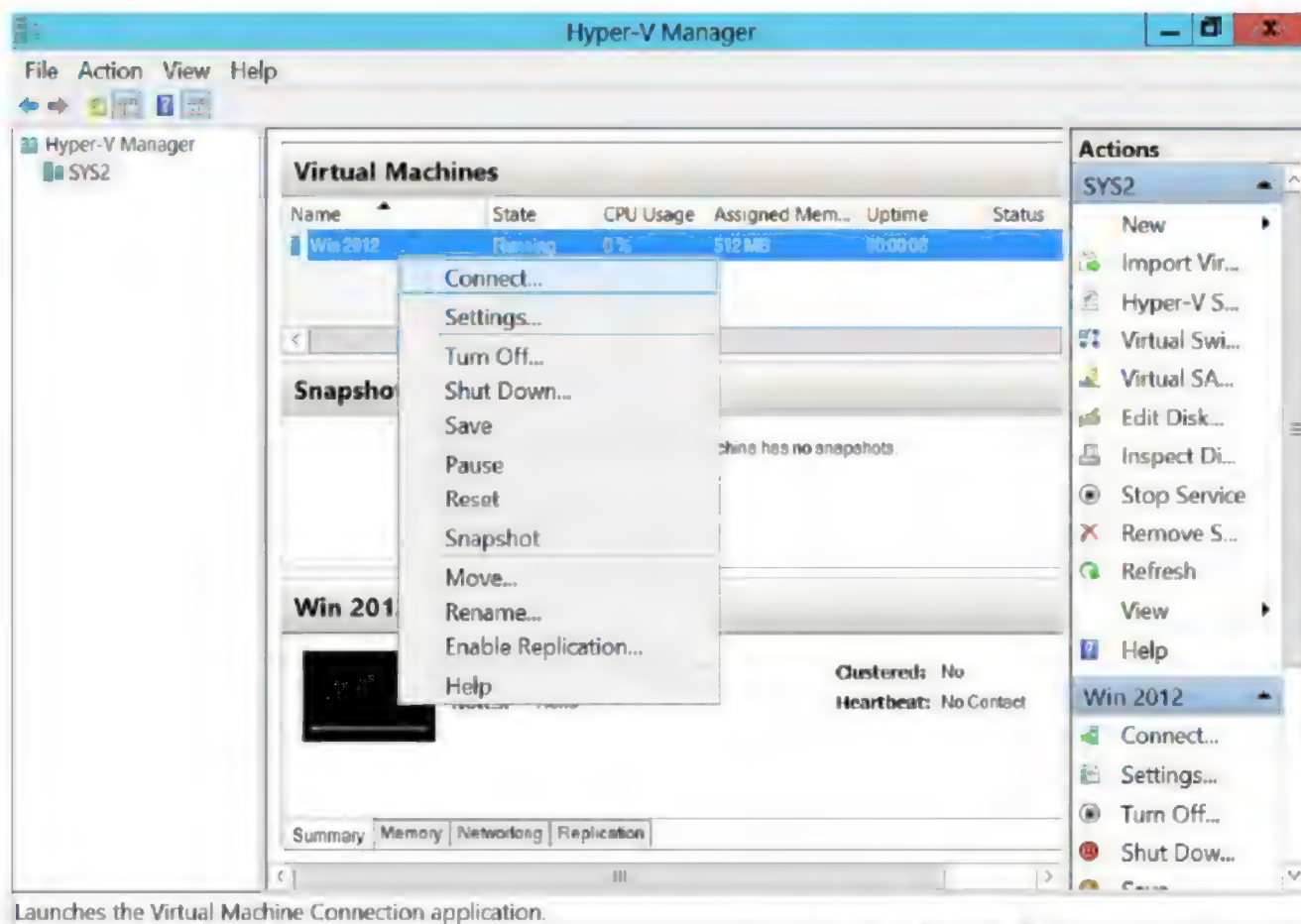


10. In Hyper-V Manager console, right click virtual machine (Ex: win 2012), click **Start**.



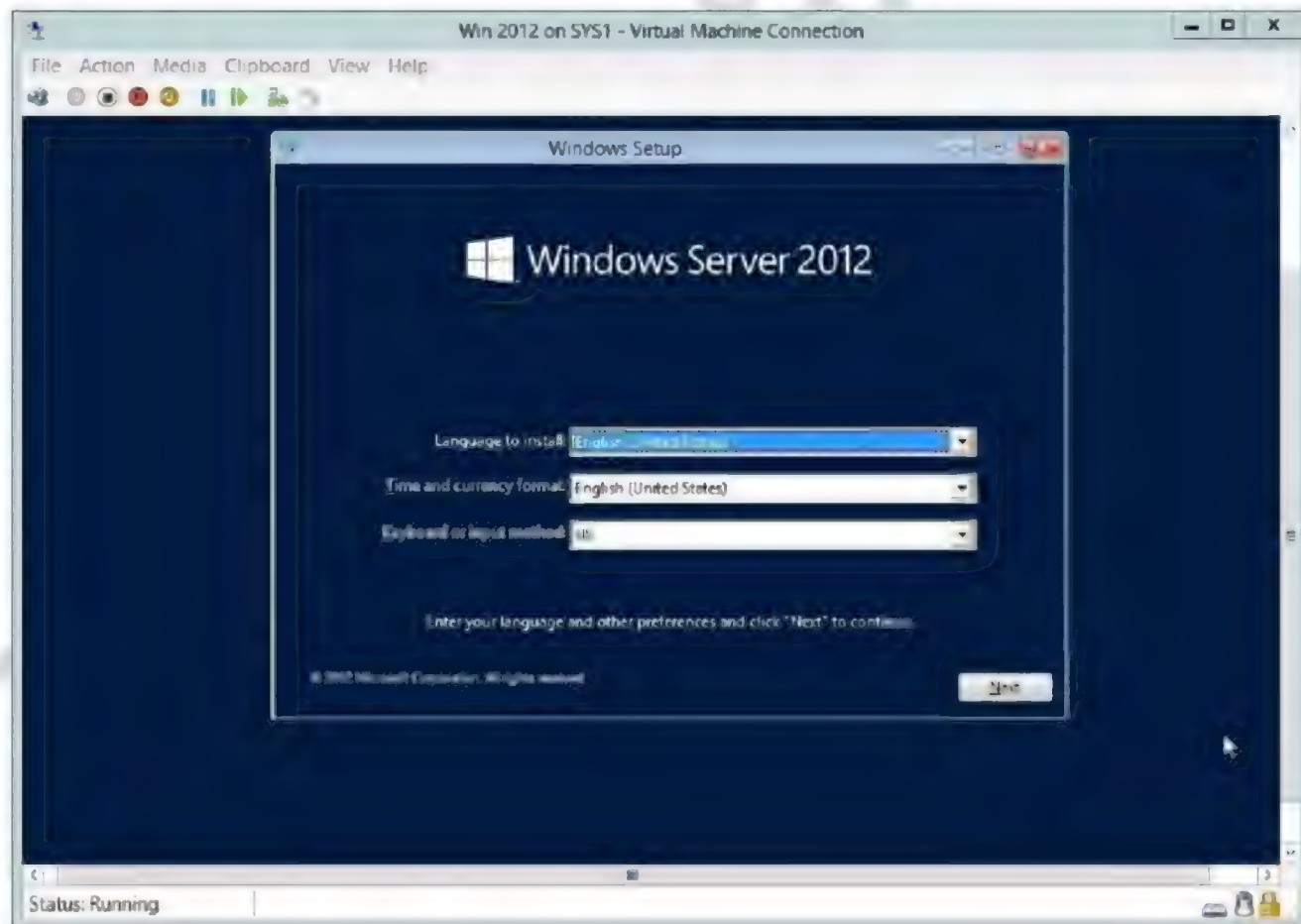


11. Right click virtual machine (Ex: win 2012), click **Connect**.



Launches the Virtual Machine Connection application.

12. Install the Operating System on Virtual Machine.



## Lab – 66: Creating Fixed Size Virtual Hard Disk

### Objective:

To create fixed size virtual hard disk using Hyper-V

### Pre-requisites:

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System Hyper-V host.

### Topology:



**SYS1**

#### Domain Controller

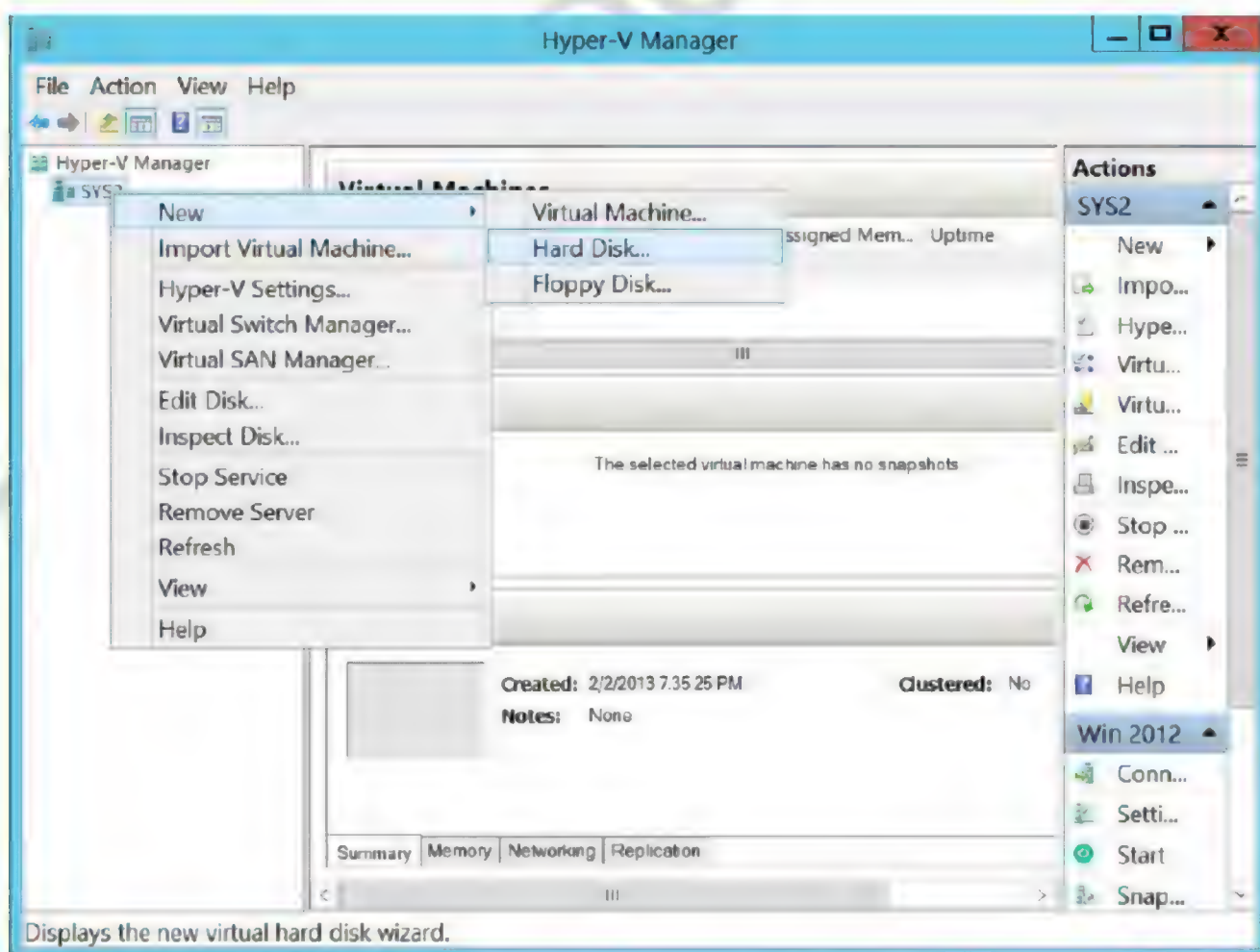
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to Start, select **Hyper-V Manager**.

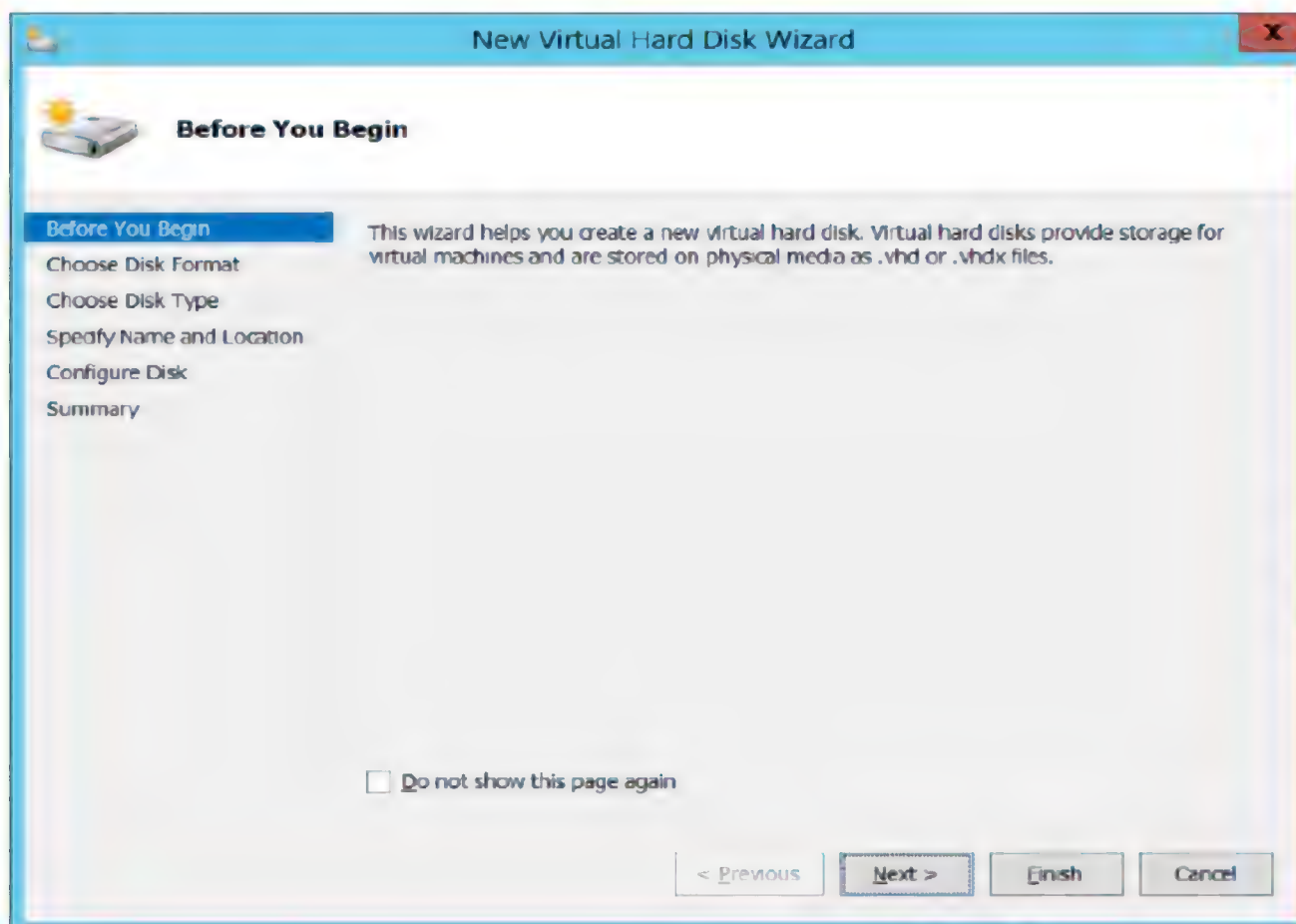


2. In Hyper-V Manager, right click on Server Name (**SYS1**) and select **New Hard Disk**.

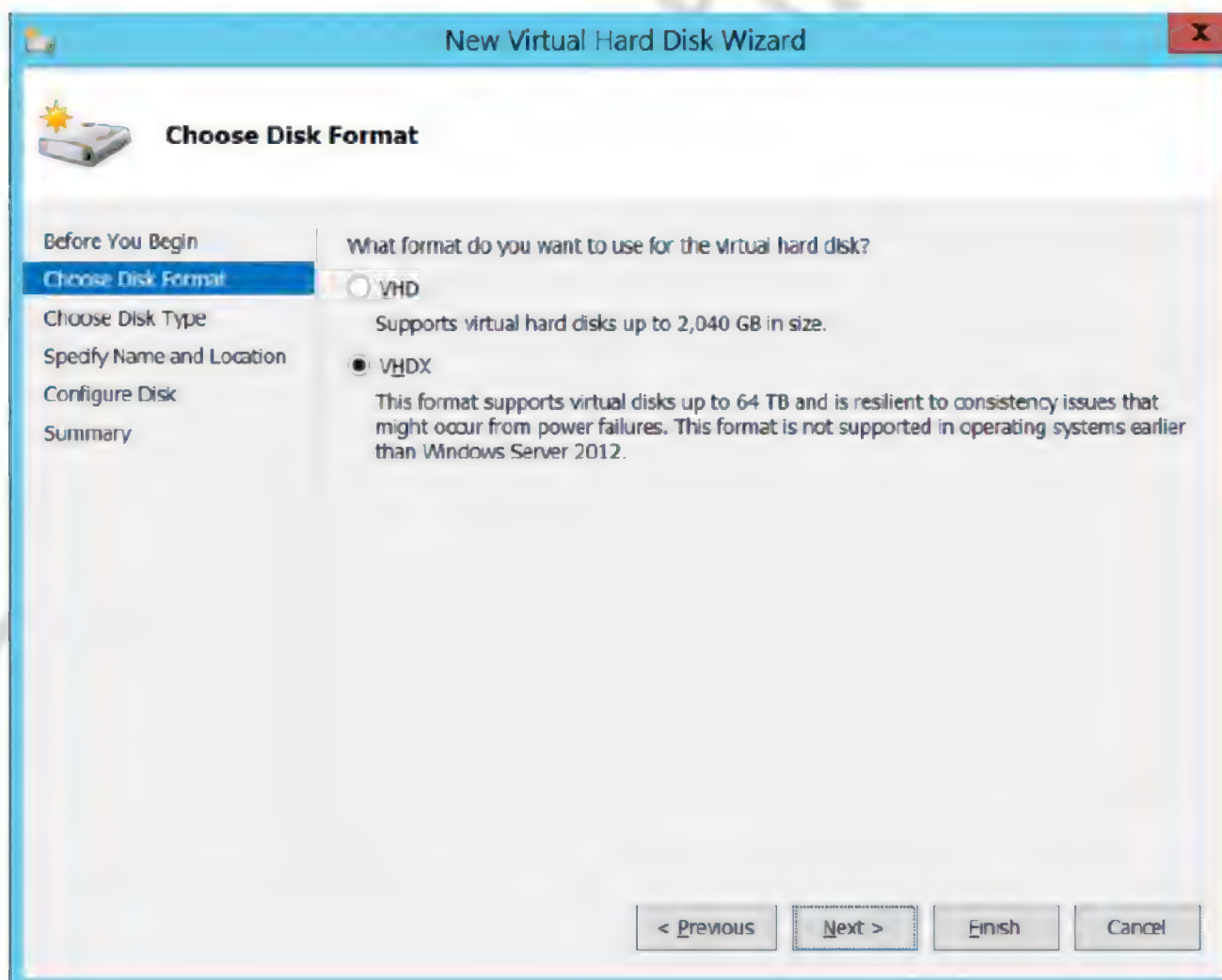




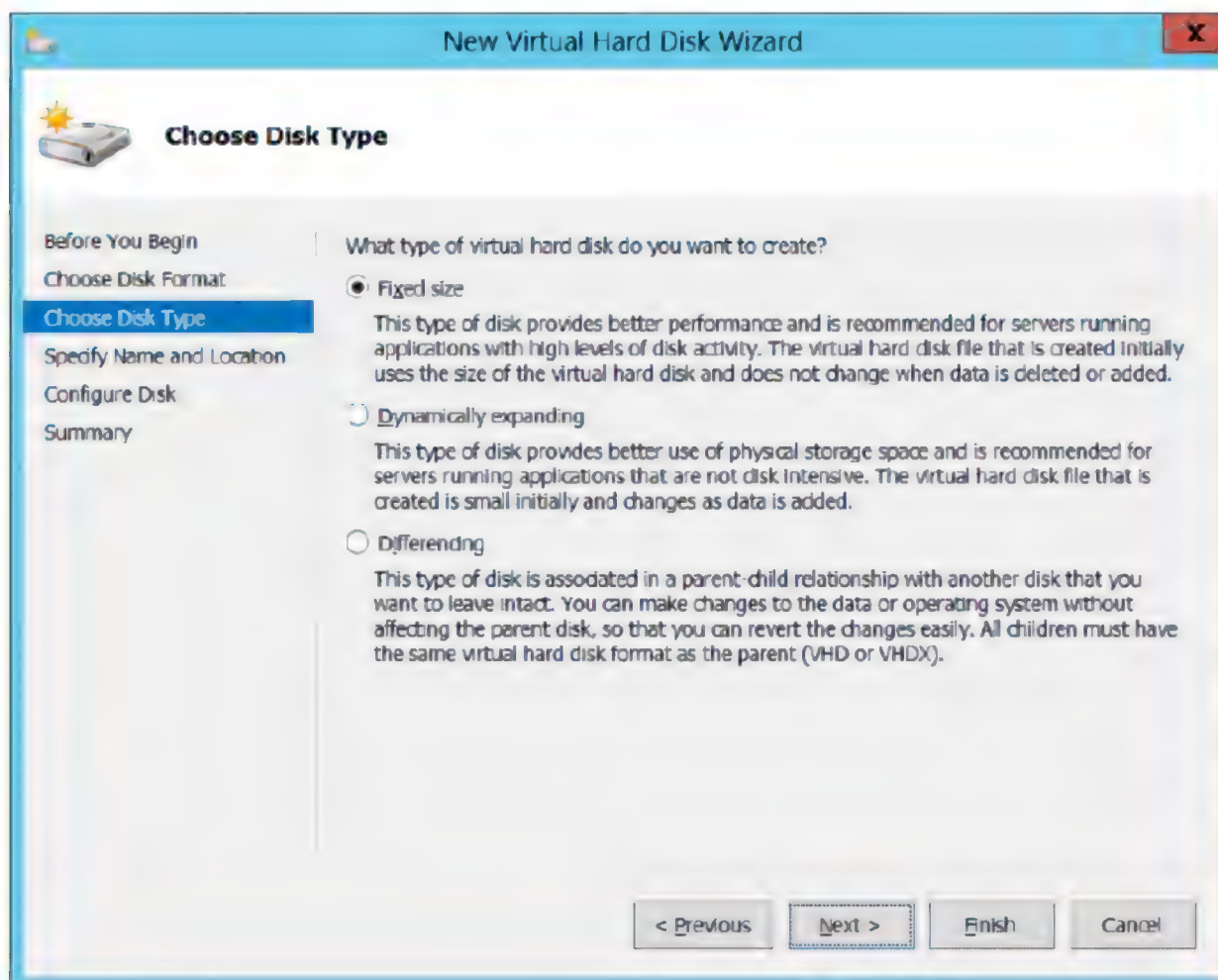
3. In Before you begin page, click **Next**.



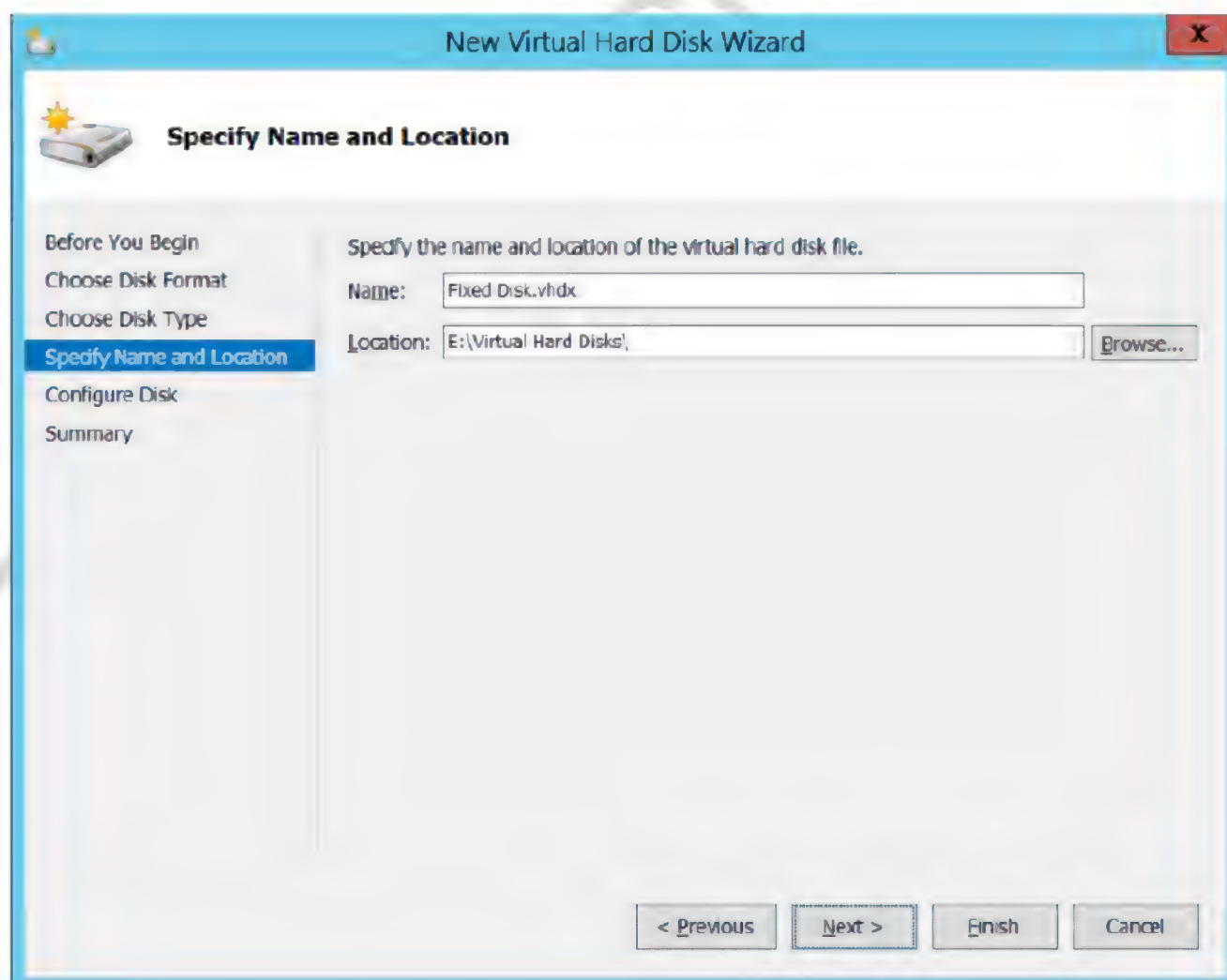
4. In Choose Disk Format Page, select **VHDX** and click **Next**.



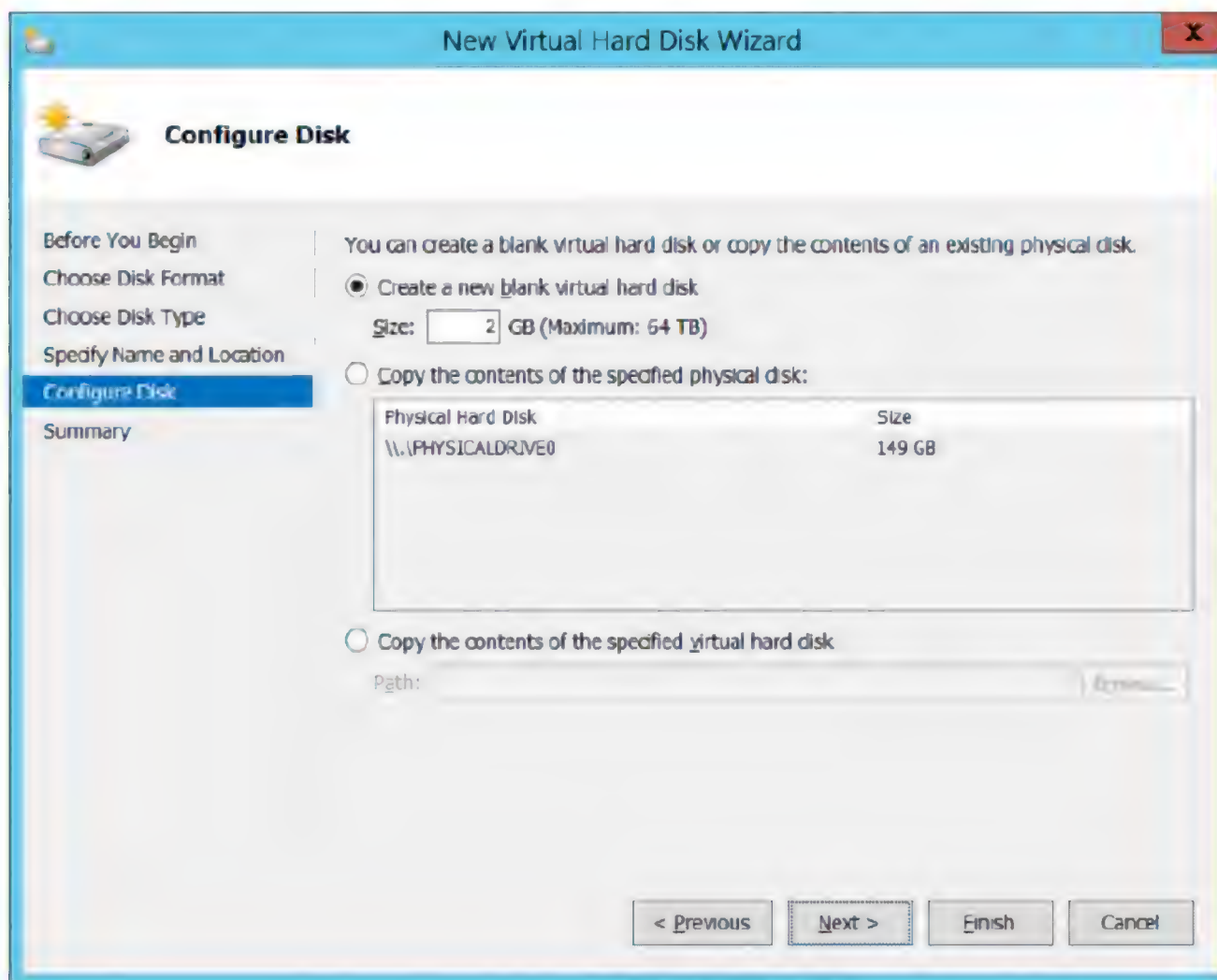
5. In Choose Disk Type, select **Fixed size** and click **Next**.



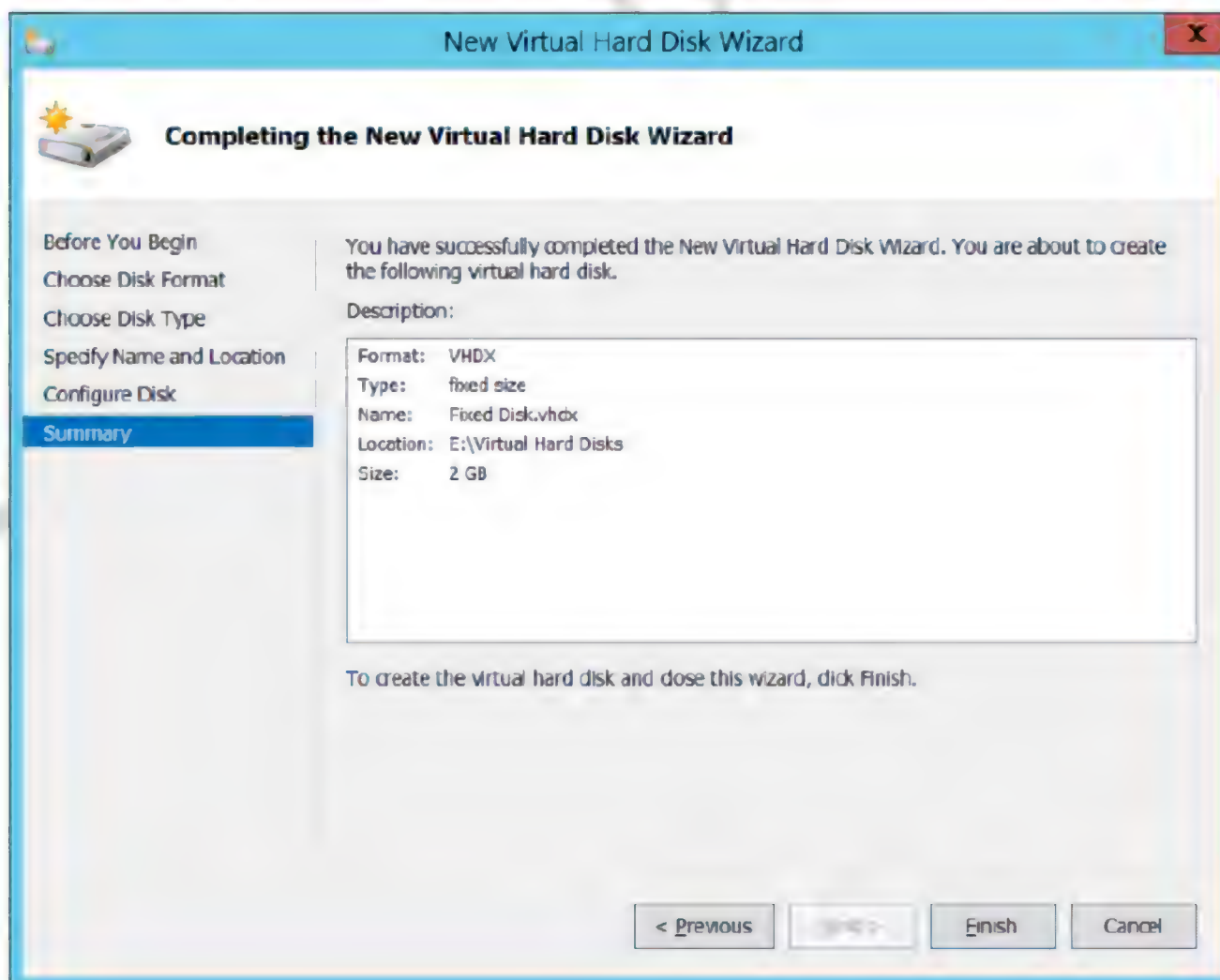
6. Enter **Name**, Browse and select **Location** for virtual hard disk, click **Next**.



7. Select **Create a new blank virtual hard disk**, Size of virtual hard disk. Click **Next**.

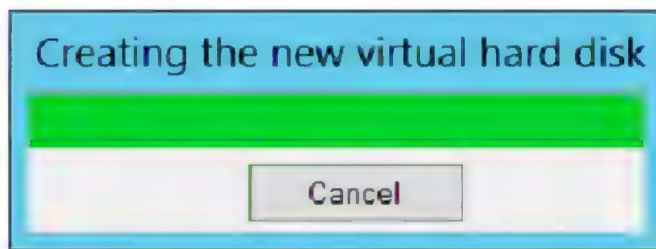


8. Click **Finish** to create the New Virtual Hard Disk.



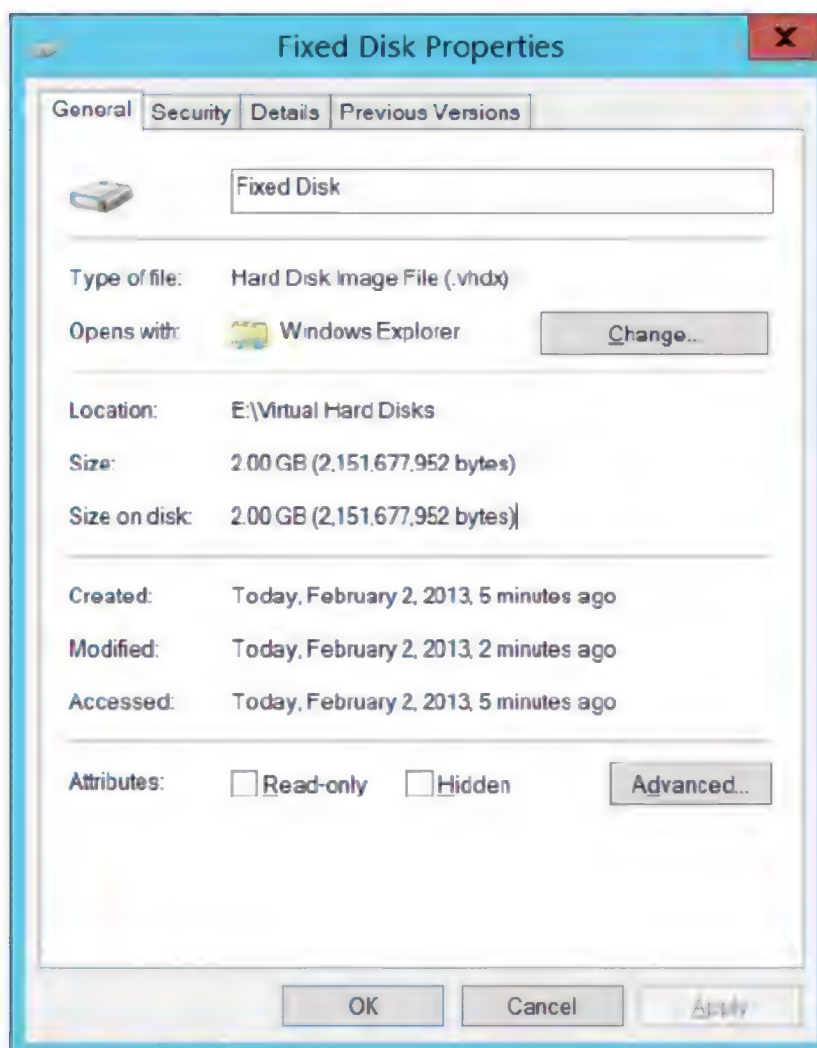


9. It creates a new Fixed size virtual hard disk.



**Verification:**

1. Go to the location of the Fixed size virtual hard disk (Ex: E:\Virtual Hard Disks), select Fixed Disk.vhdx file → Properties and verify the Size and Size on disk.



## Lab – 67: Creating Dynamically Expanding Virtual Hard Disk

### Objective:

To create dynamically expanding virtual hard disk using Hyper-V

### Pre-requisites:

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System Hyper-V host.

### Topology:



### SYS1

#### Domain Controller

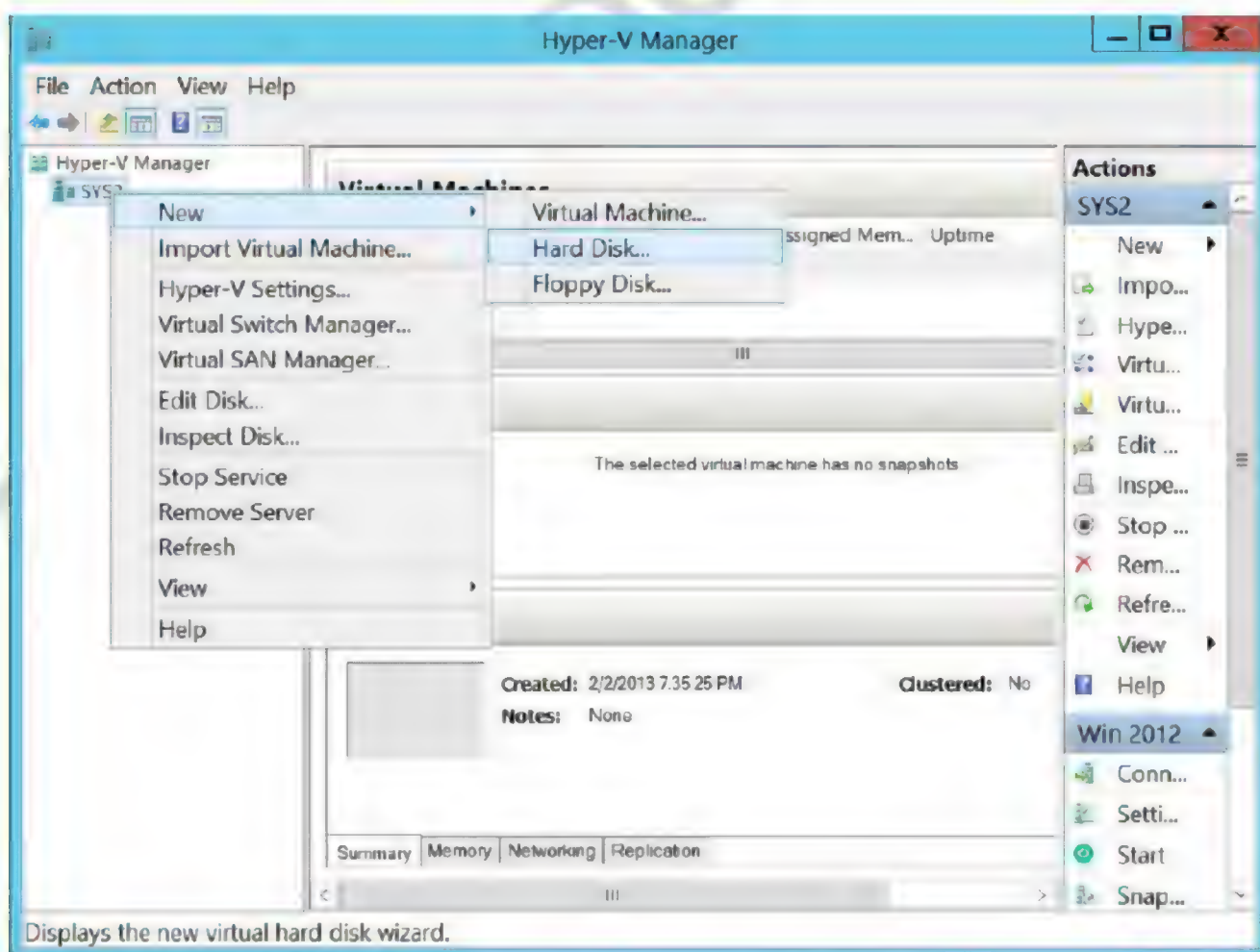
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to Start, select **Hyper-V Manager**.

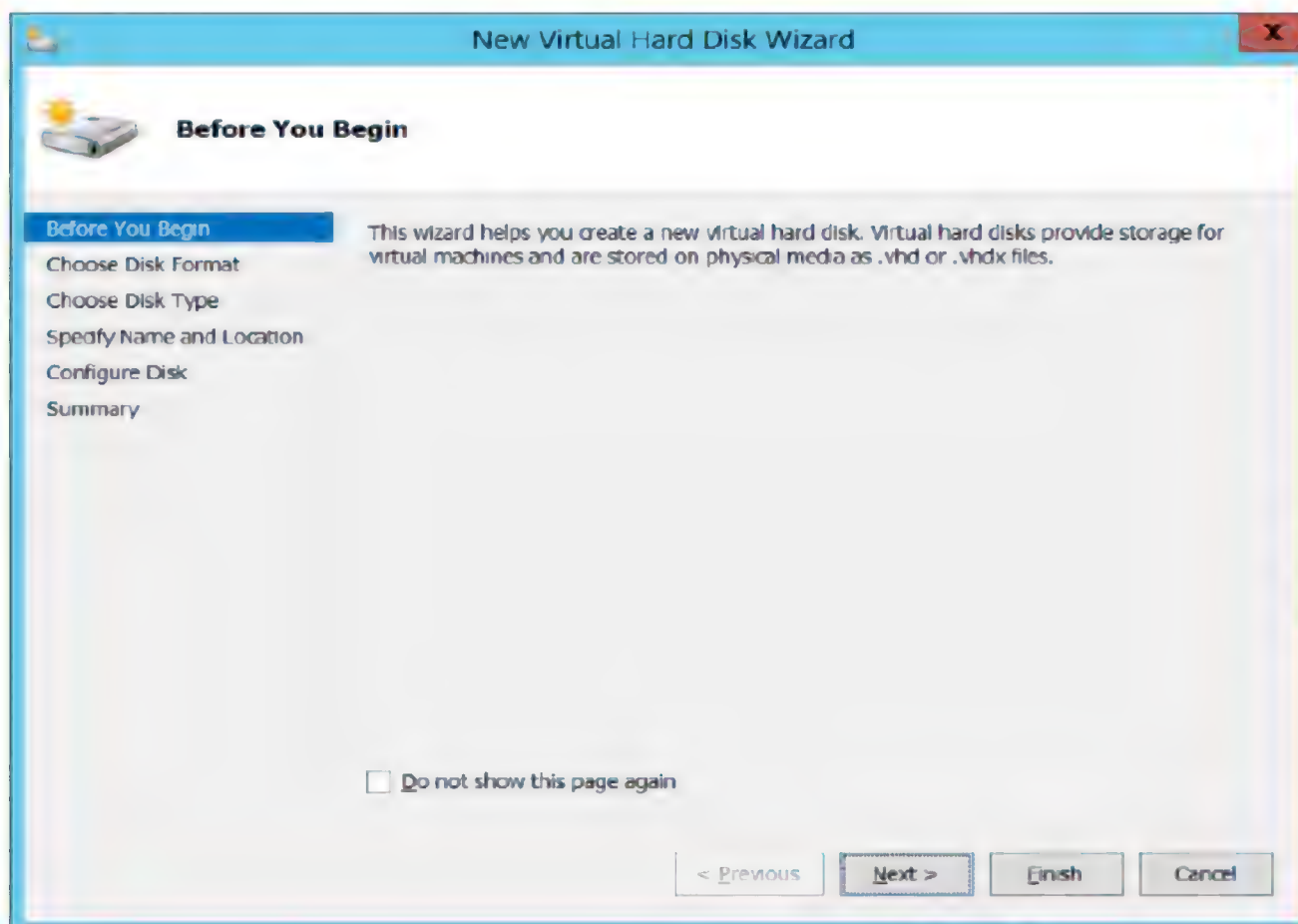


2. In Hyper-V Manager, right click on Server Name (**SYS1**) and select **New Hard Disk**.

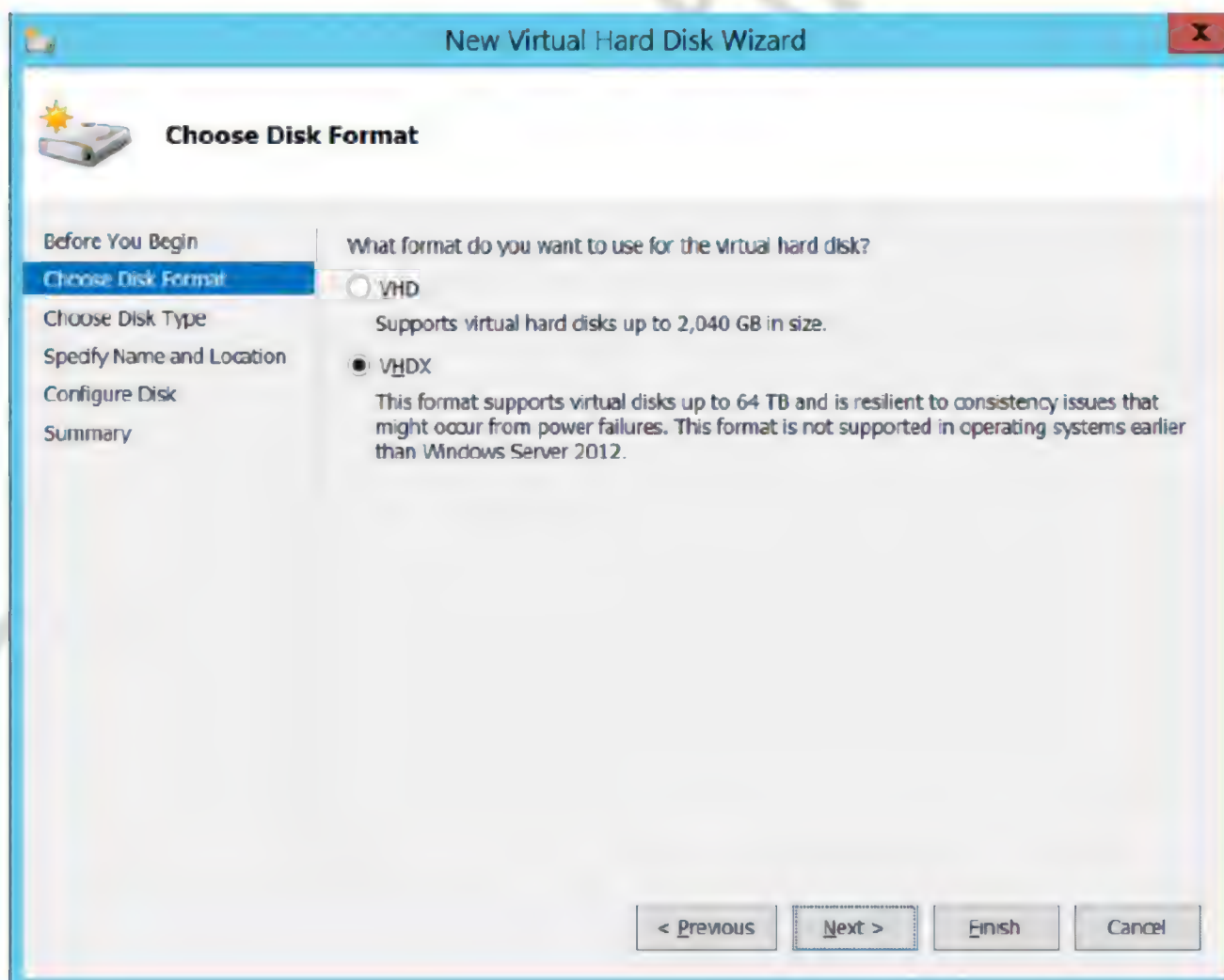




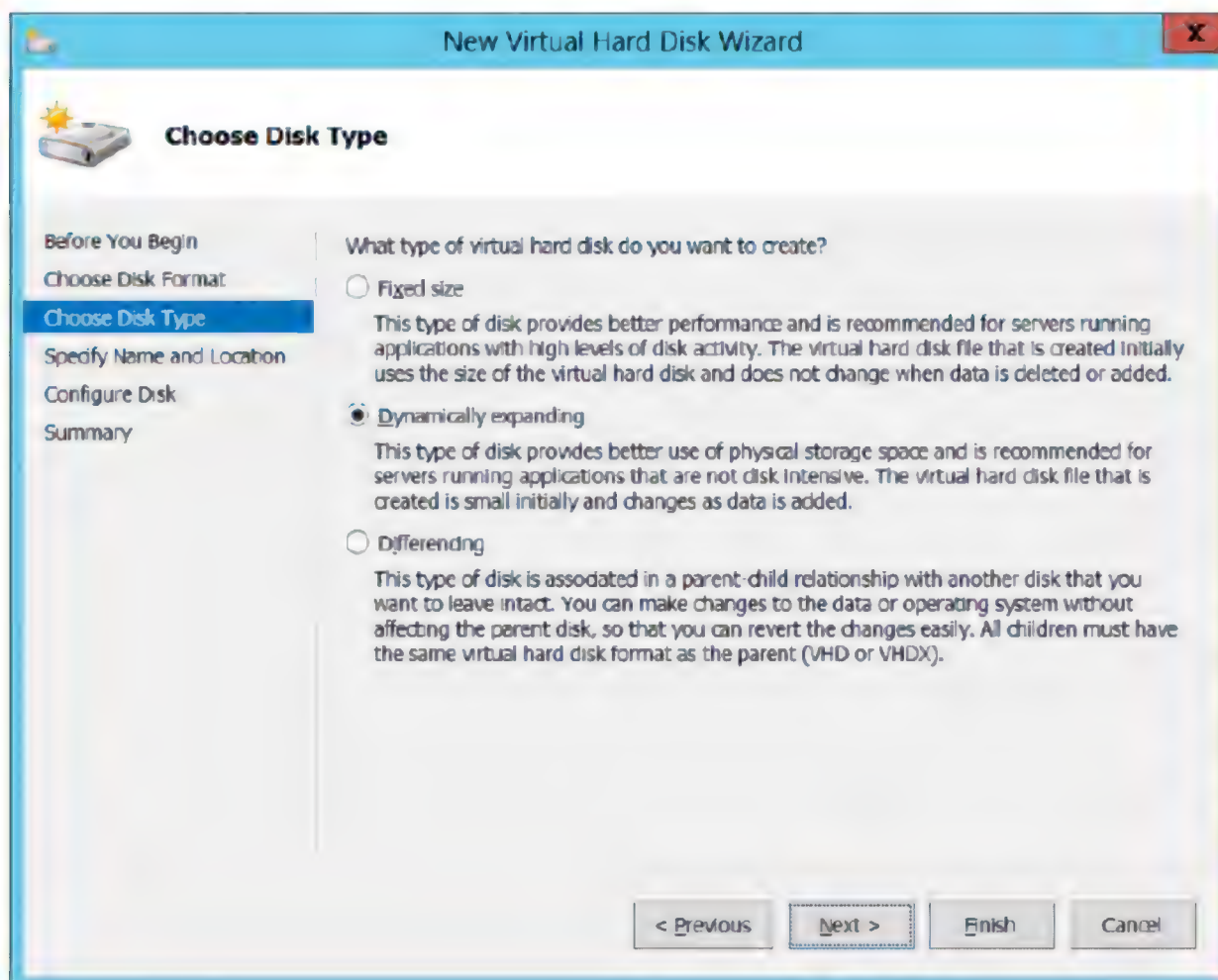
3. In Before you begin page, click **Next**.



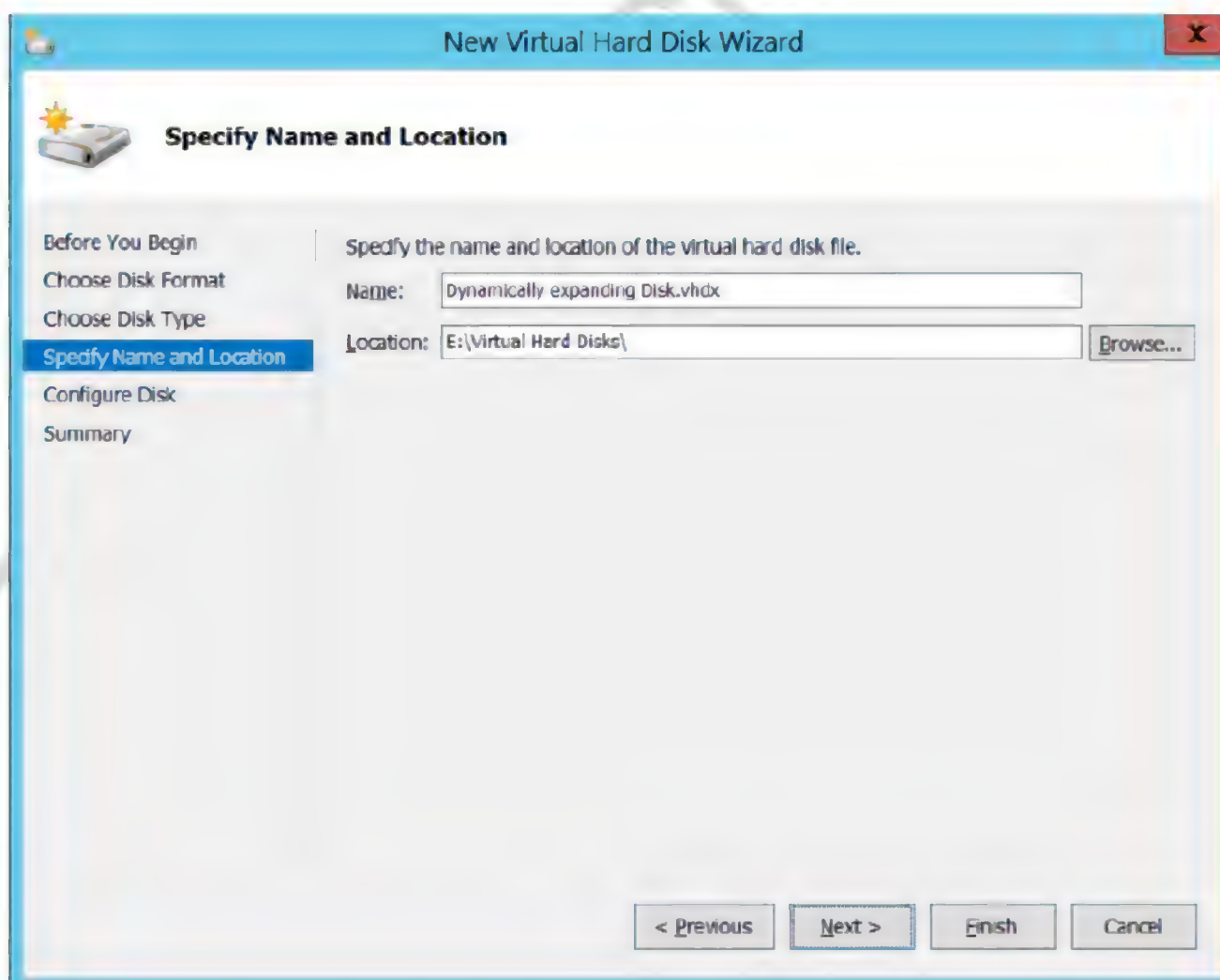
4. In Choose Disk Format Page, select **VHDX** and click **Next**.



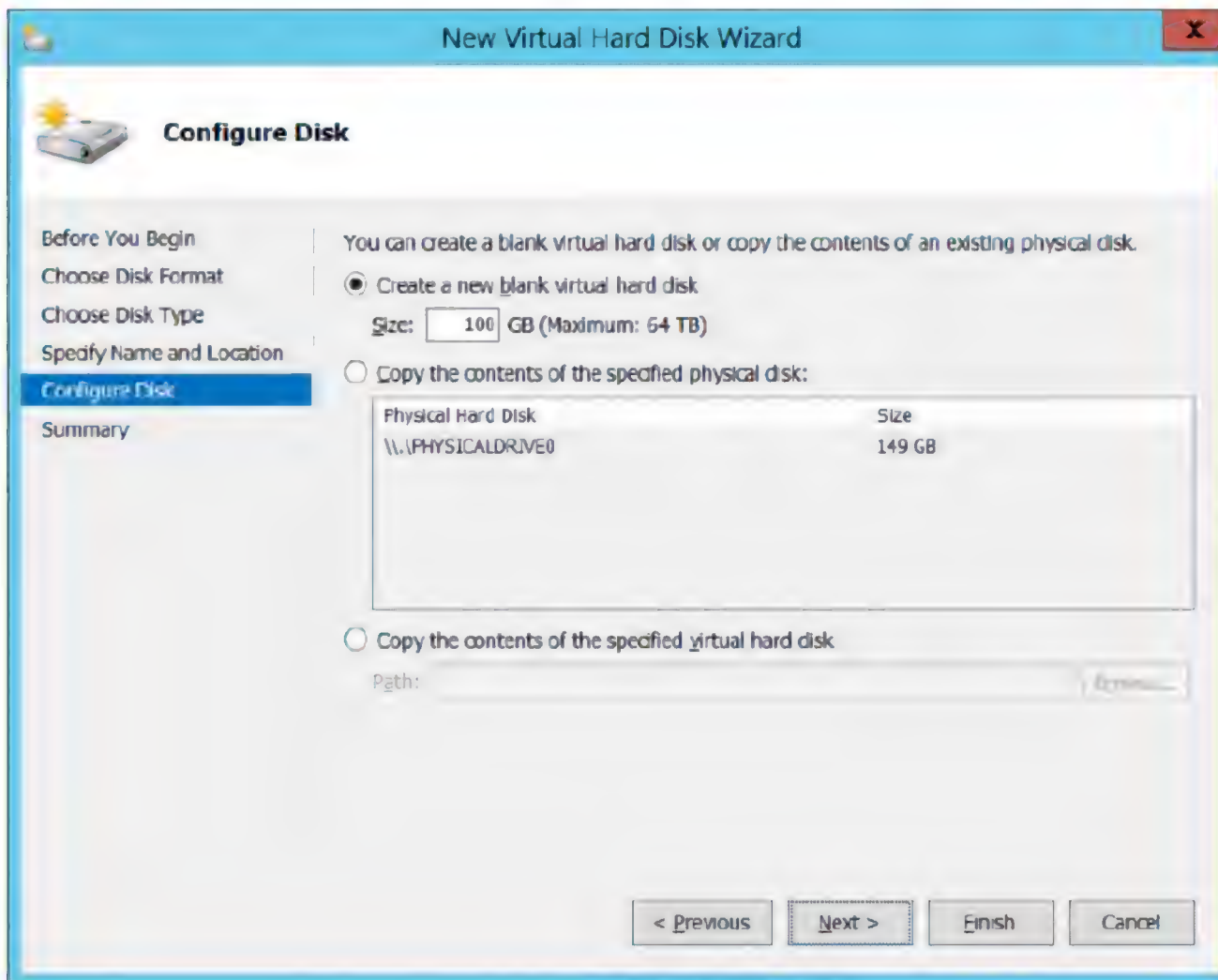
5. In Choose Disk Type, select **Dynamically expanding** and click **Next**.



6. Enter **Name**, Browse and select **Location** for virtual hard disk, click **Next**.

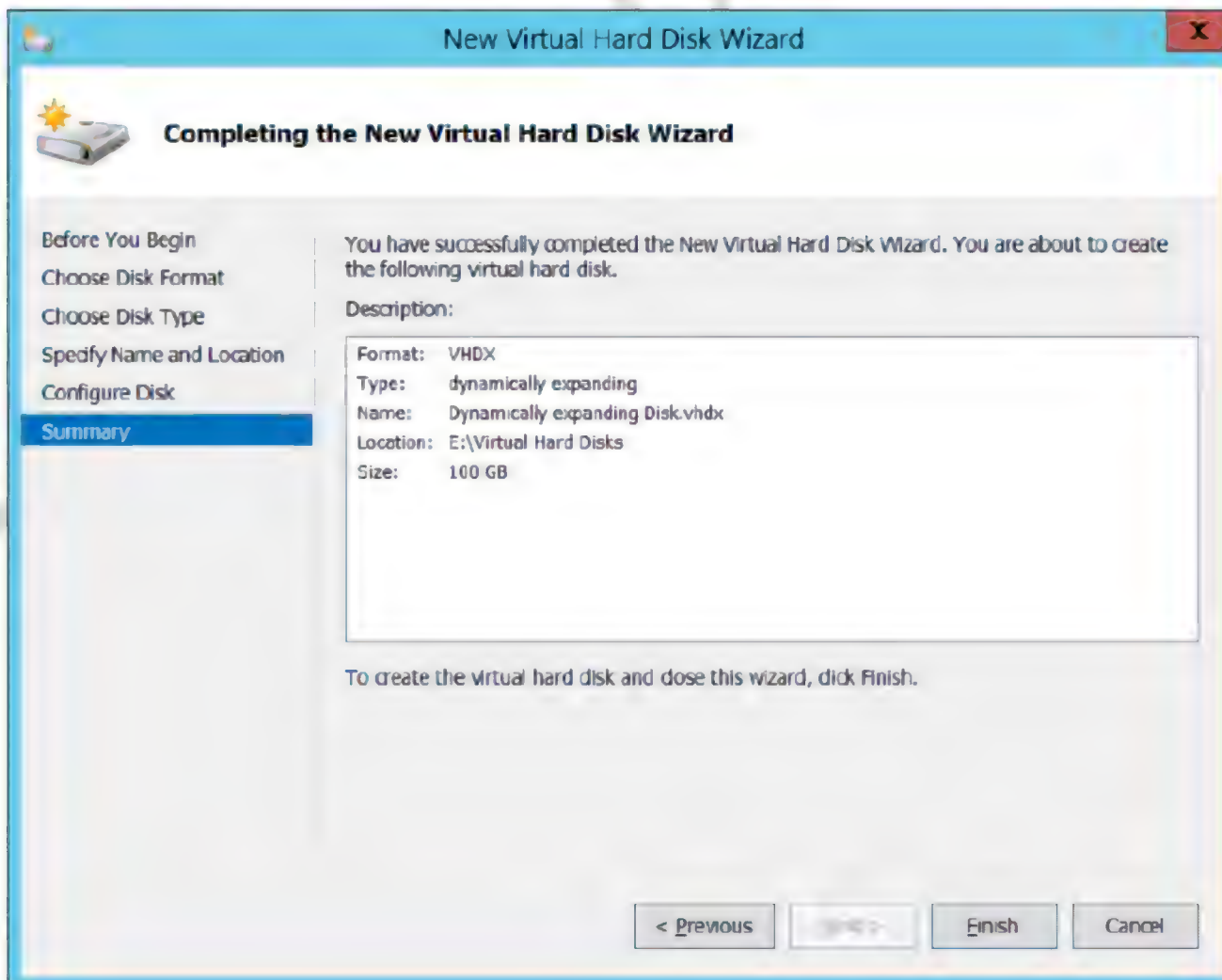


7. Select **Create a new blank virtual hard disk**, **Size of virtual hard disk**. Click **Next**.



The screenshot shows the 'New Virtual Hard Disk Wizard' window at the 'Configure Disk' step. The left sidebar contains a list of steps: 'Before You Begin', 'Choose Disk Format', 'Choose Disk Type', 'Specify Name and Location', 'Configure Disk' (highlighted), and 'Summary'. The main area has a heading 'Configure Disk' and a sub-heading 'You can create a blank virtual hard disk or copy the contents of an existing physical disk.' There are two radio buttons: 'Create a new blank virtual hard disk' (selected) and 'Copy the contents of the specified physical disk:'. Below the first radio button is a 'Size' field set to '100 GB (Maximum: 64 TB)'. Below the second radio button is a table with two columns: 'Physical Hard Disk' and 'Size'. The table contains one row: '\\.\PHYSICALDRIVE0' and '149 GB'. At the bottom, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

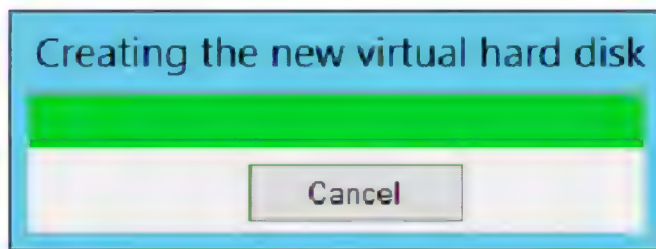
8. Click **Finish** to create the New Virtual Hard Disk.



The screenshot shows the 'New Virtual Hard Disk Wizard' window at the 'Completing the New Virtual Hard Disk Wizard' step. The left sidebar contains a list of steps: 'Before You Begin', 'Choose Disk Format', 'Choose Disk Type', 'Specify Name and Location', 'Configure Disk', and 'Summary' (highlighted). The main area has a heading 'Completing the New Virtual Hard Disk Wizard' and a sub-heading 'You have successfully completed the New Virtual Hard Disk Wizard. You are about to create the following virtual hard disk.' Below this is a 'Description:' section with a table containing the following information: 'Format: VHDX', 'Type: dynamically expanding', 'Name: Dynamically expanding Disk.vhdx', 'Location: E:\Virtual Hard Disks', and 'Size: 100 GB'. At the bottom, there are four buttons: '< Previous', 'Next >', 'Finish', and 'Cancel'.

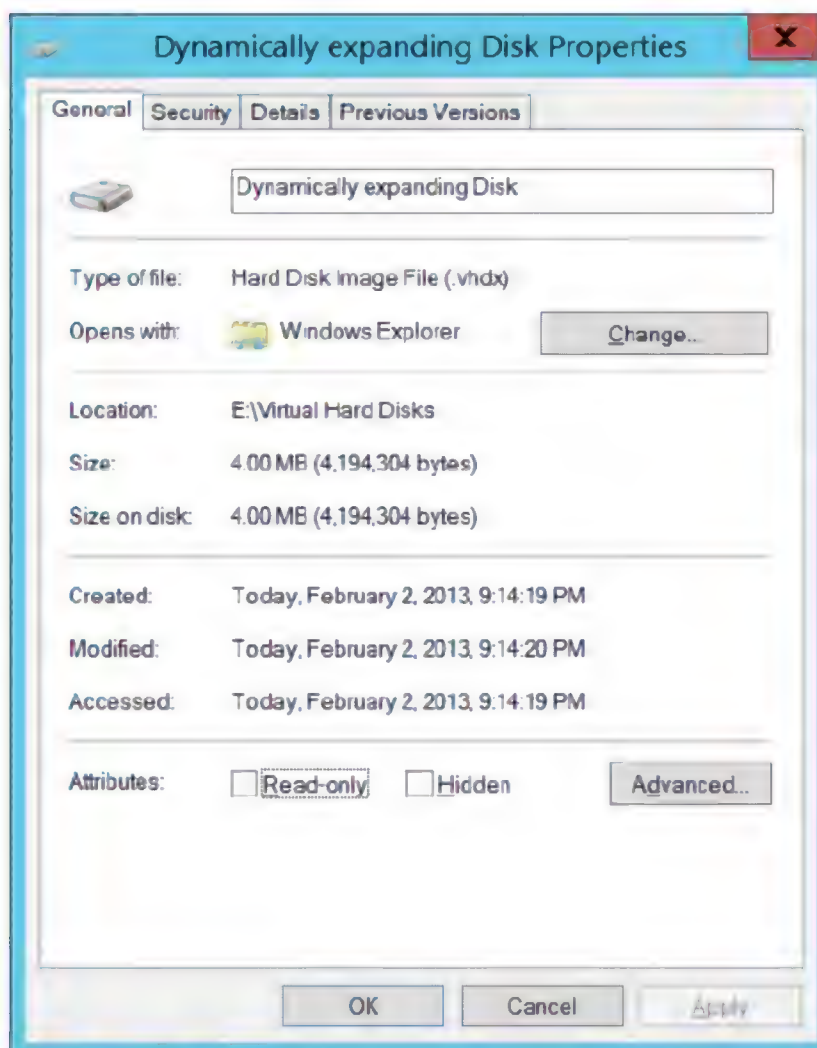


9. It creates a new Fixed size virtual hard disk.



**Verification:**

1. Go to the location of the Dynamically expanding virtual hard disk (Ex: E:\Virtual Hard Disks), select Dynamically expanding Disk.vhdx file → Properties and verify the Size and Size on disk.



## Lab – 68: Creating Differencing Virtual Hard Disk

**Objective:**

To create differencing disk using Hyper-V

**Pre-requisites:**

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System Hyper-V host.

**Topology:****SYS1****Domain Controller**

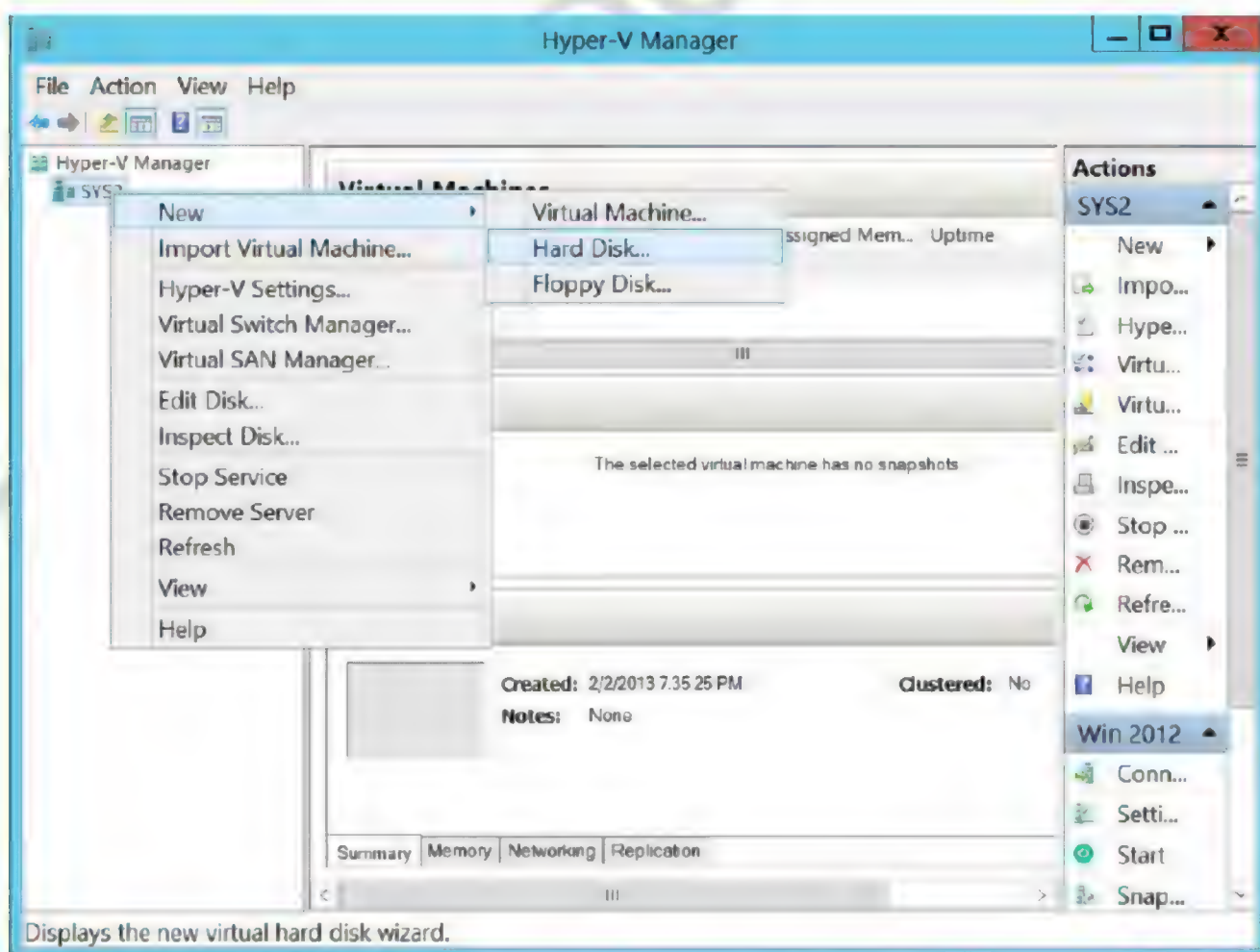
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to Start, select **Hyper-V Manager**.

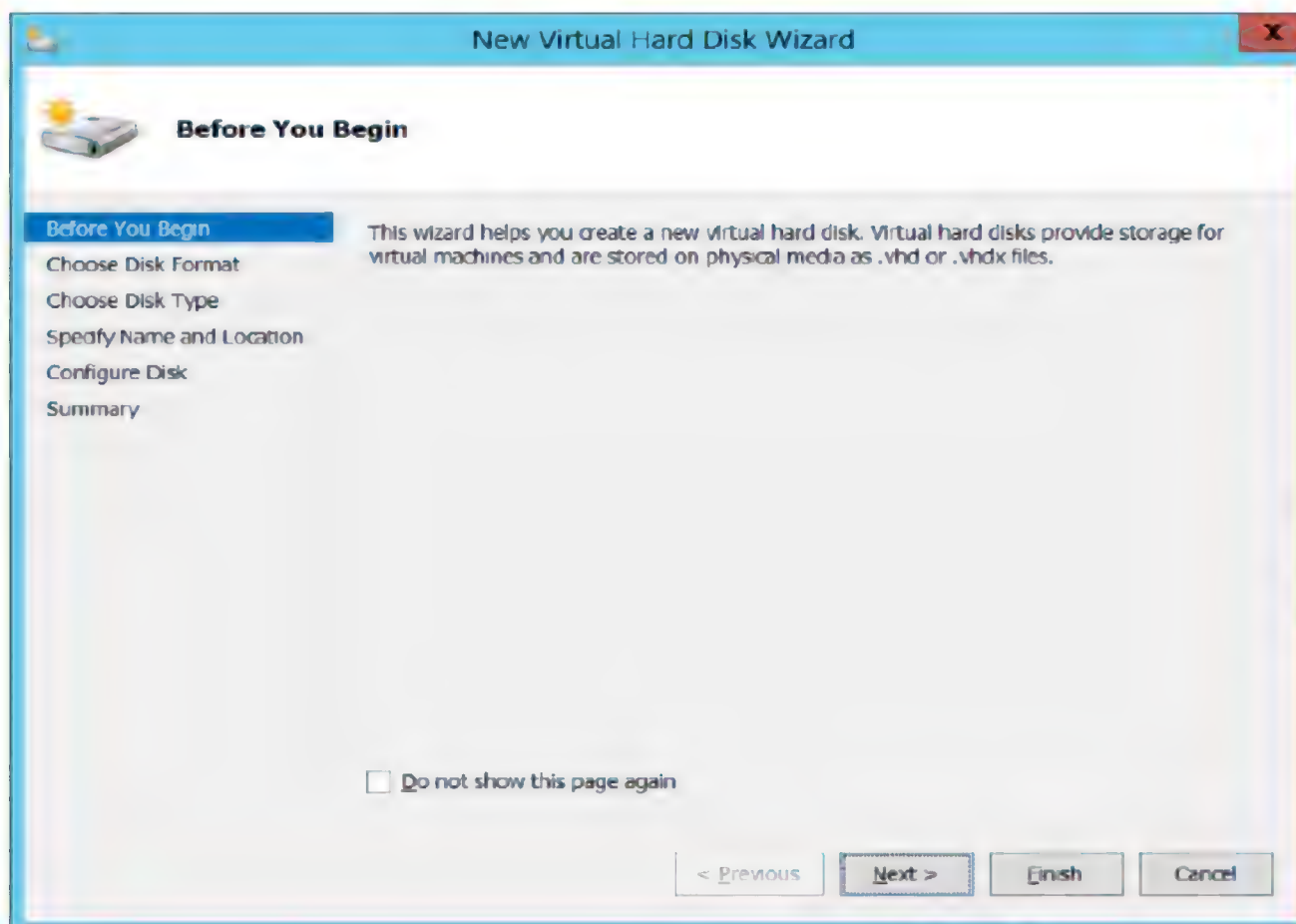


2. In Hyper-V Manager, right click on Server Name (**SYS1**) and select **New Hard Disk**.

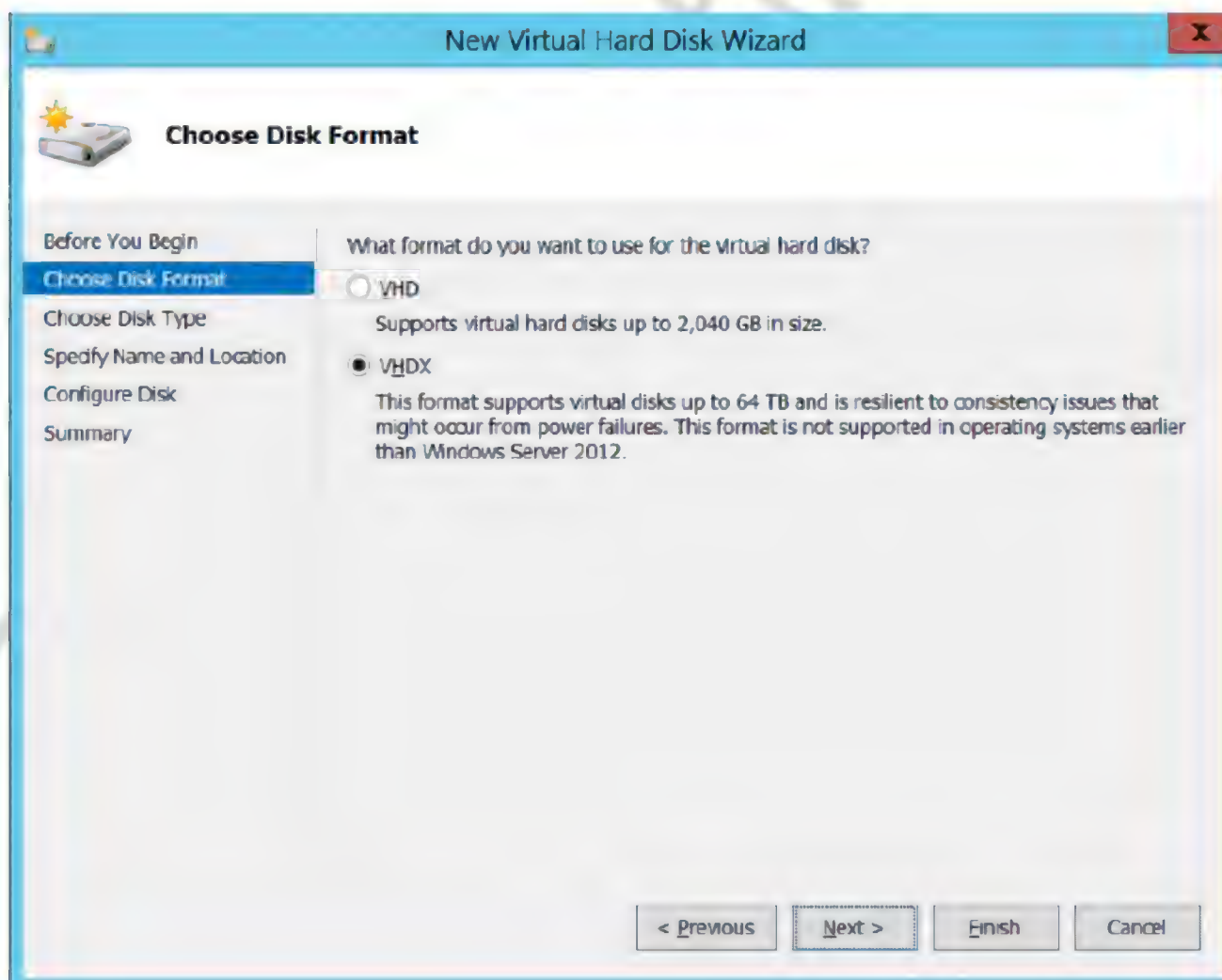




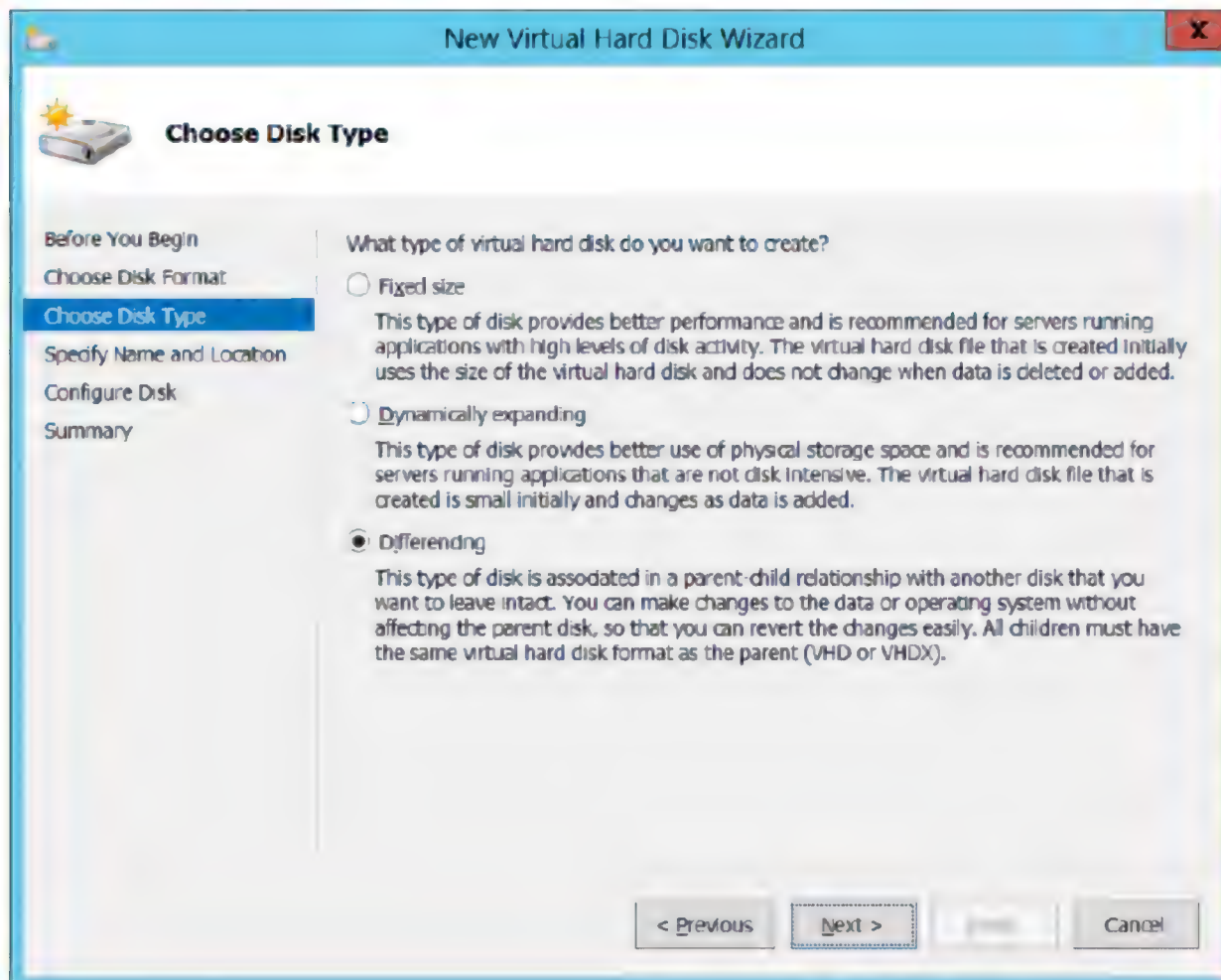
3. In Before you begin page, click **Next**.



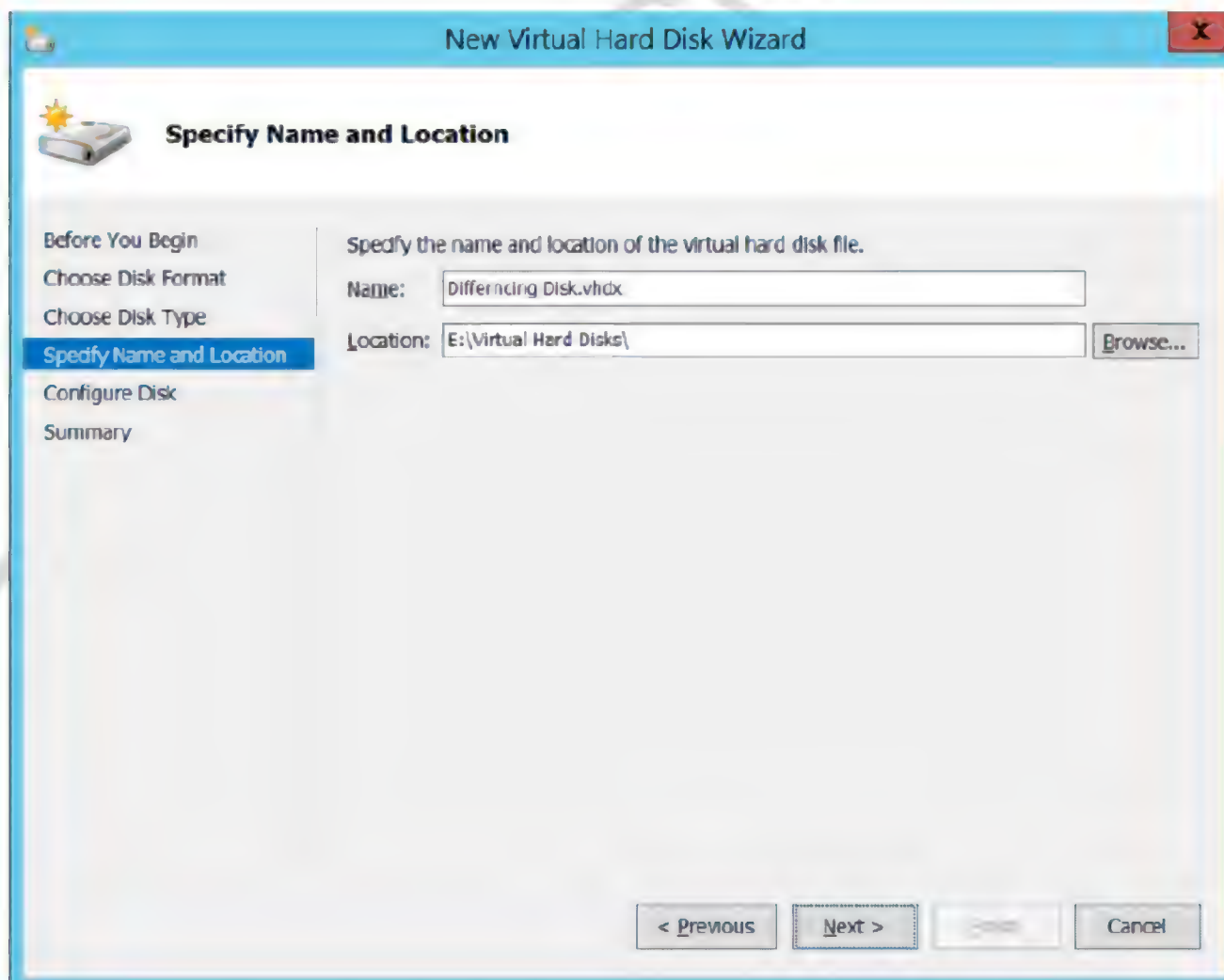
4. In Choose Disk Format Page, select **VHDX** and click **Next**.



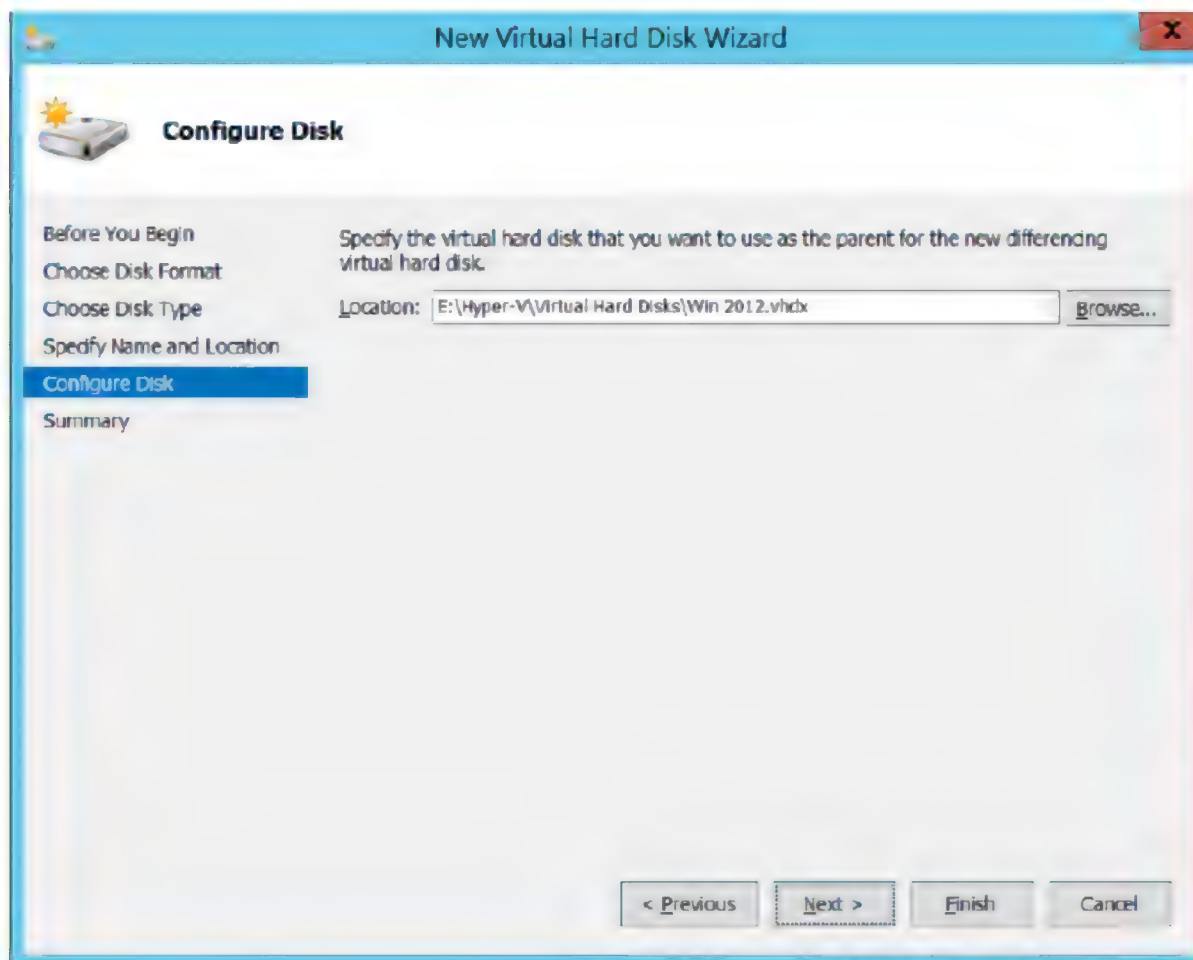
5. In Choose Disk Type, select **Differencing** and click **Next**.



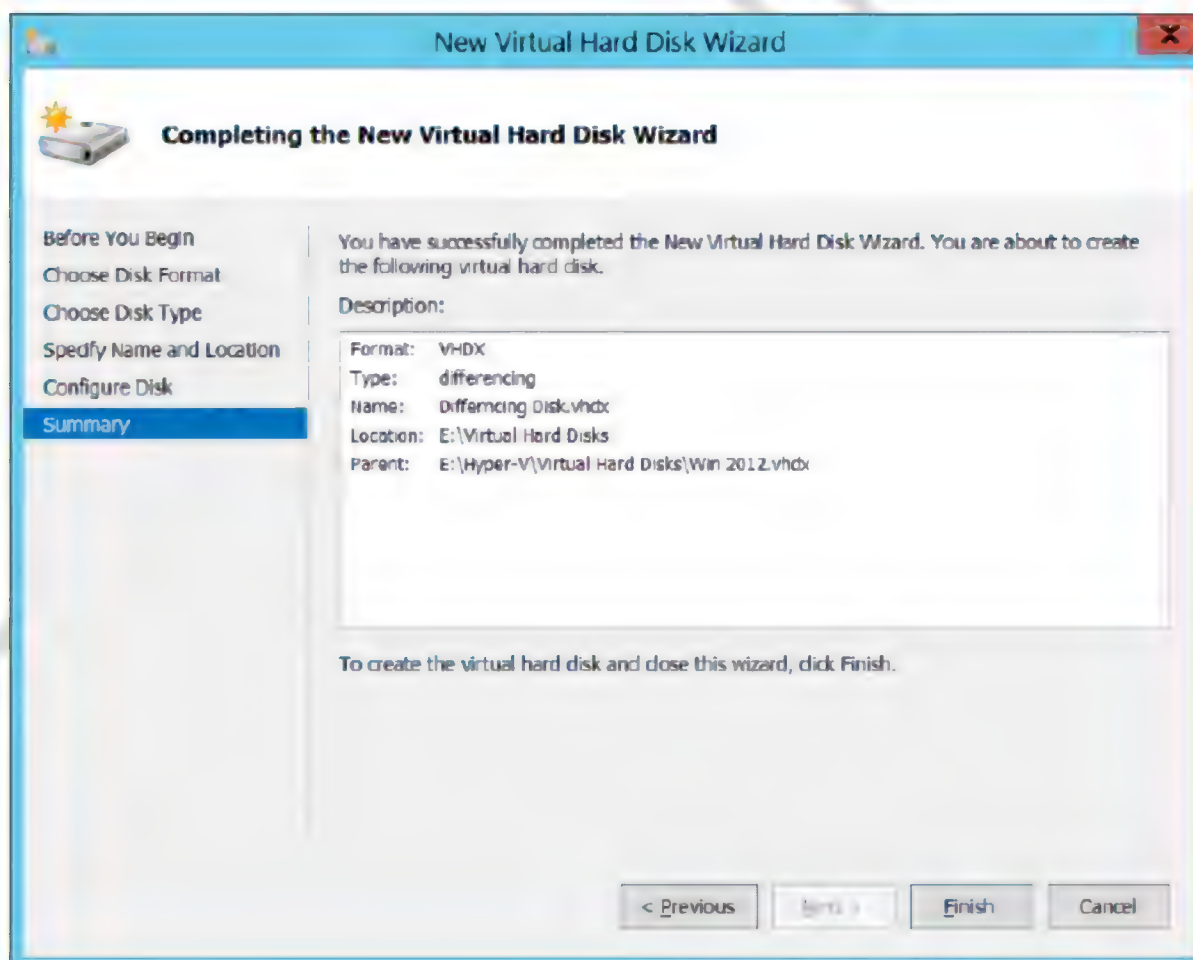
6. Enter **Name**, Browse and select **Location** for virtual hard disk, click **Next**.



7. In Configure Disk Page, Browse and select the Parent Disk, click **Next**.



8. Click **Finish** to create the New Virtual Hard Disk.



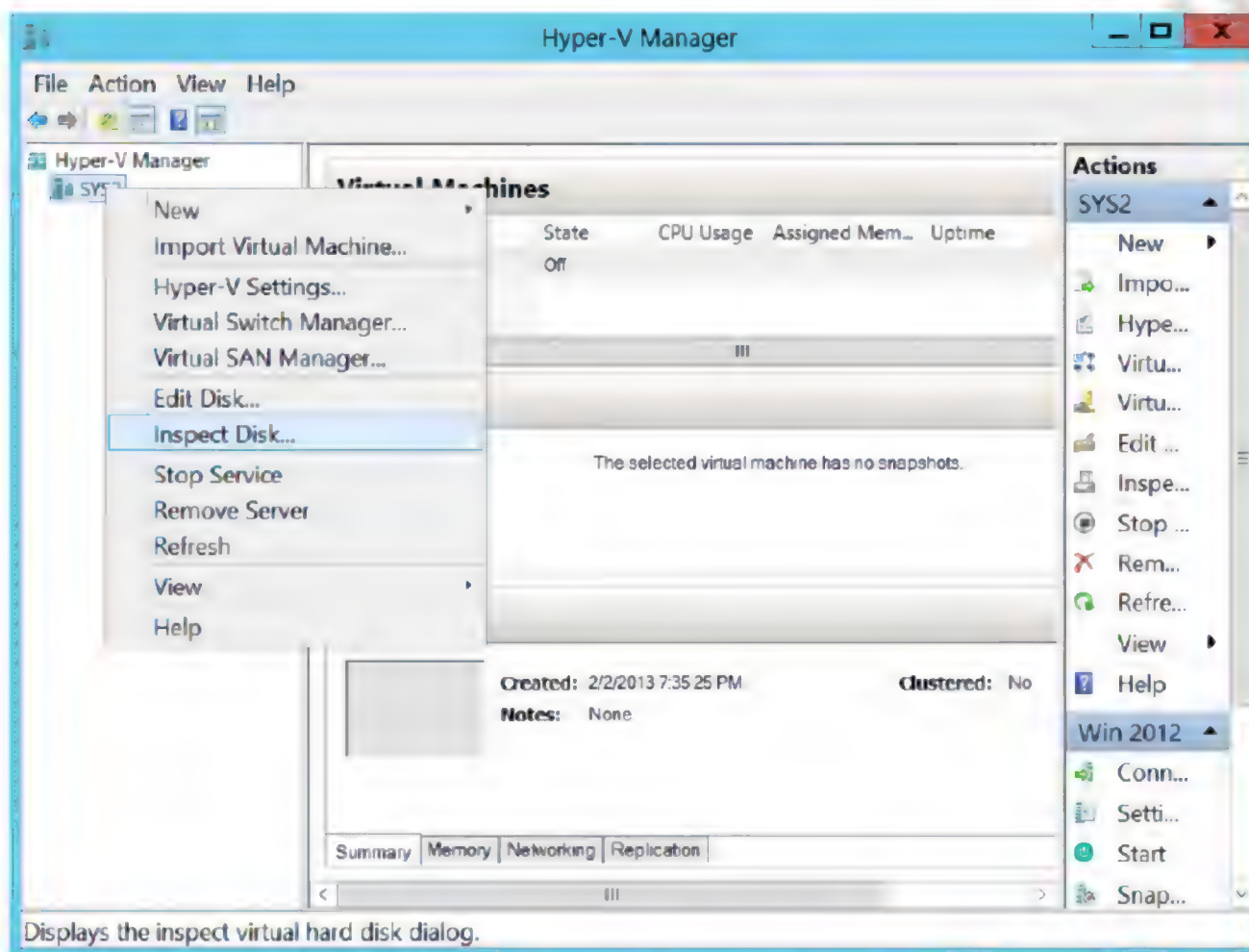


9. It creates a new Differencing virtual hard disk.

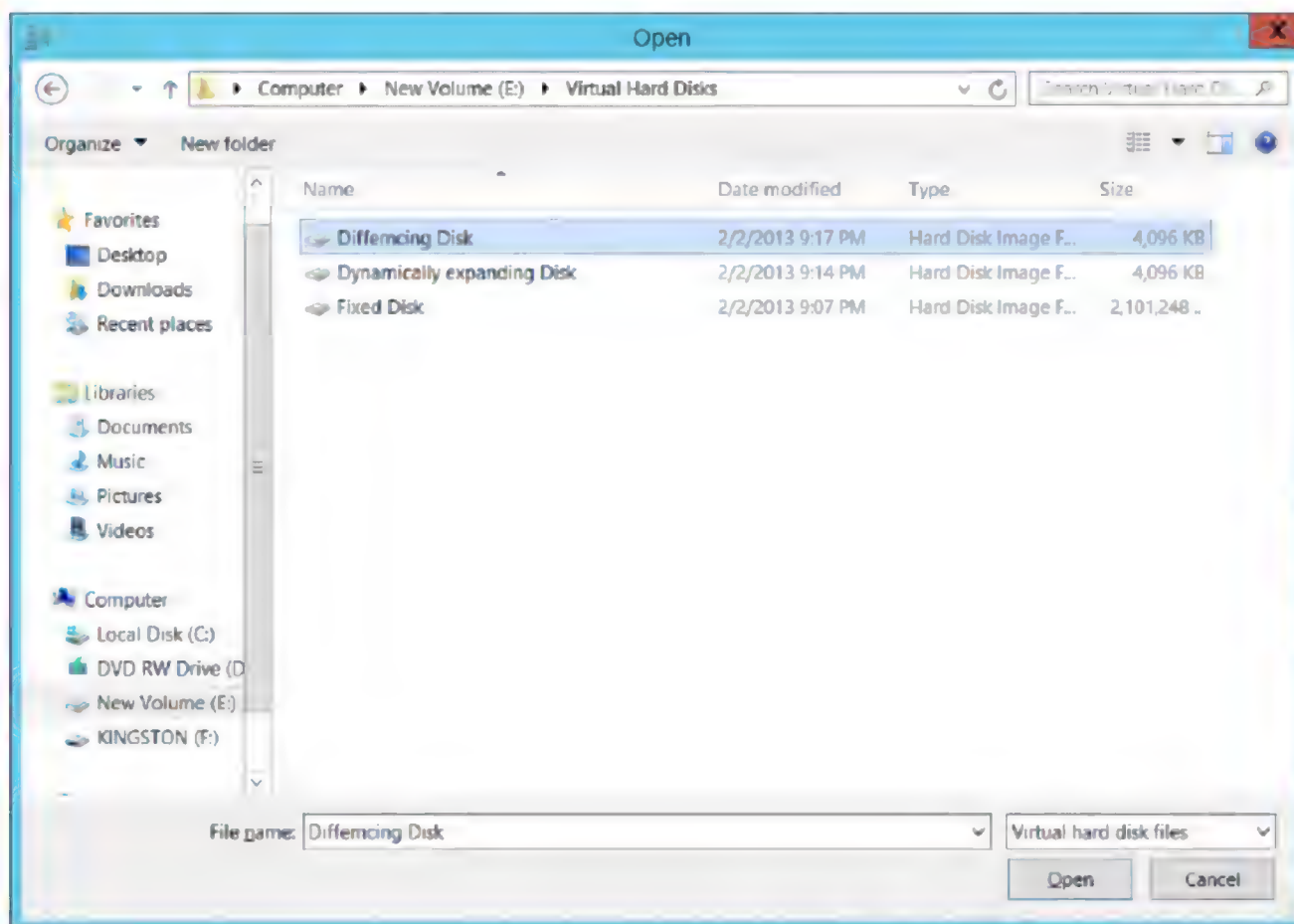


**Verification:**

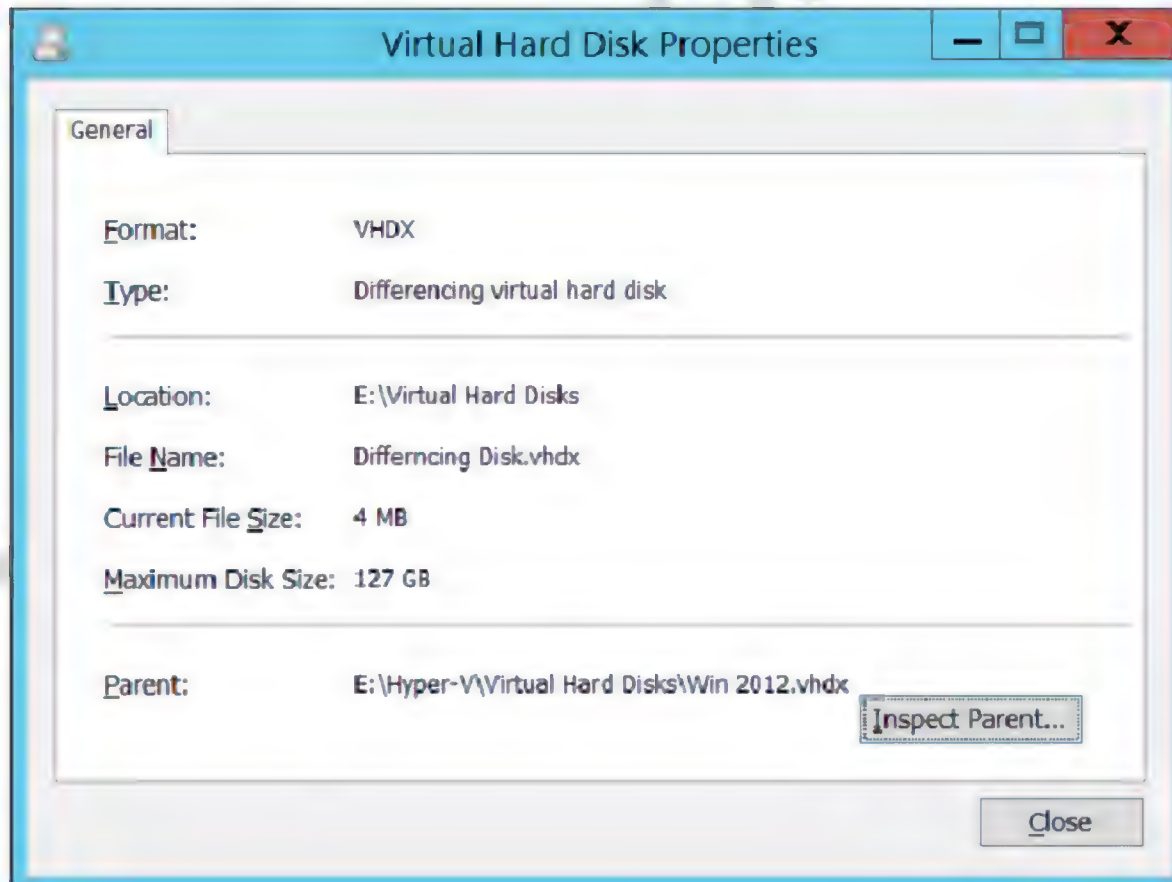
1. Go to Hyper-V Manager Console, right click Server, select **Inspect Disk**.



2. Browse and select the **Differencing Disk** from (E:\Virtual Hard Disks).



3. In Virtual Hard Disk Properties, select **Inspect Parent**.



4. Verify the Parent Virtual Hard Disk Properties and click **Close**.





## Lab – 69: Configuring Virtual Networks

**Objective:**

To create virtual switches using Hyper-V

**Pre-requisites:**

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System Hyper-V host.

**Topology:****SYS1****Domain Controller**

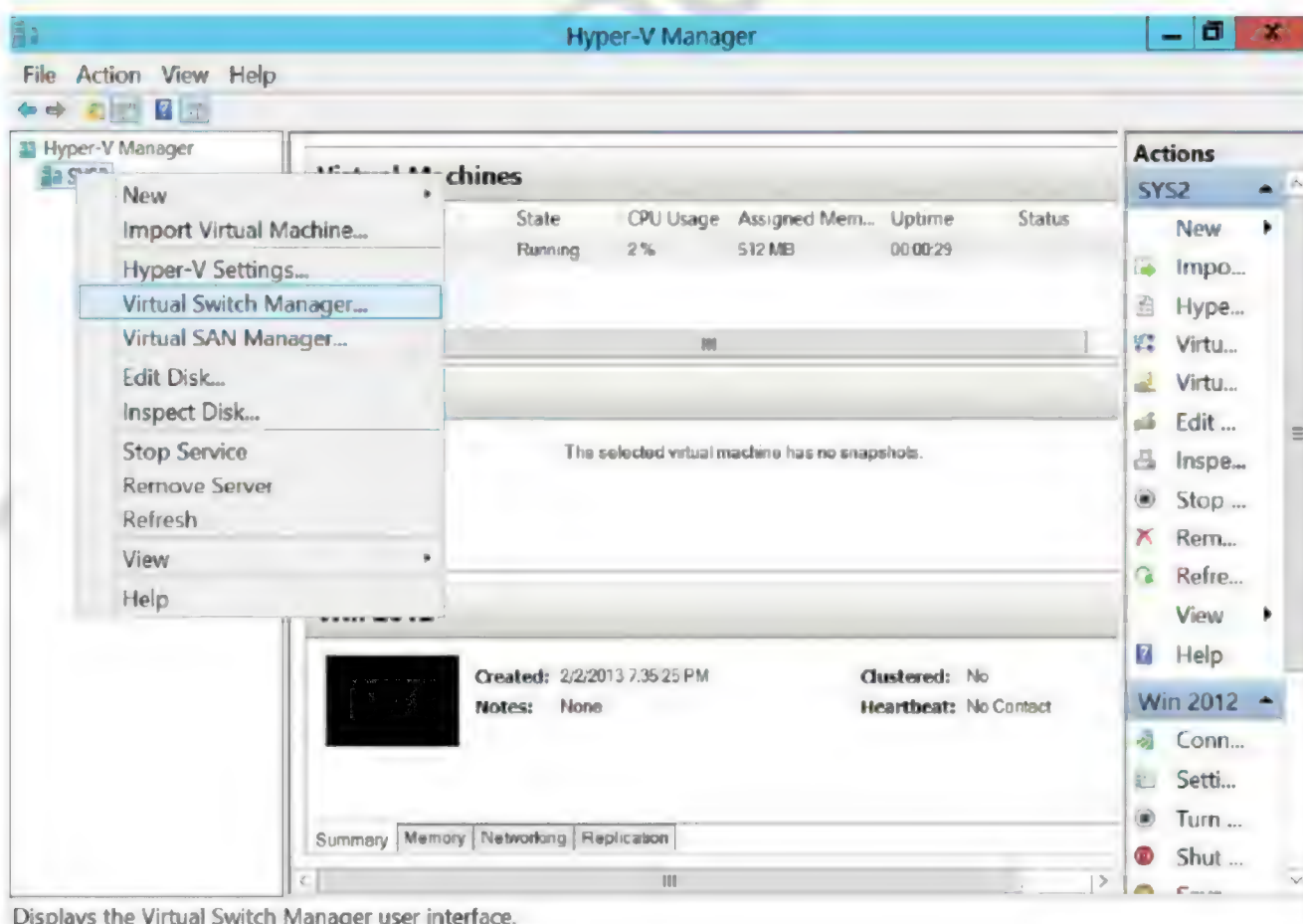
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

**Steps:**

1. Go to Start, select **Hyper-V Manager**.

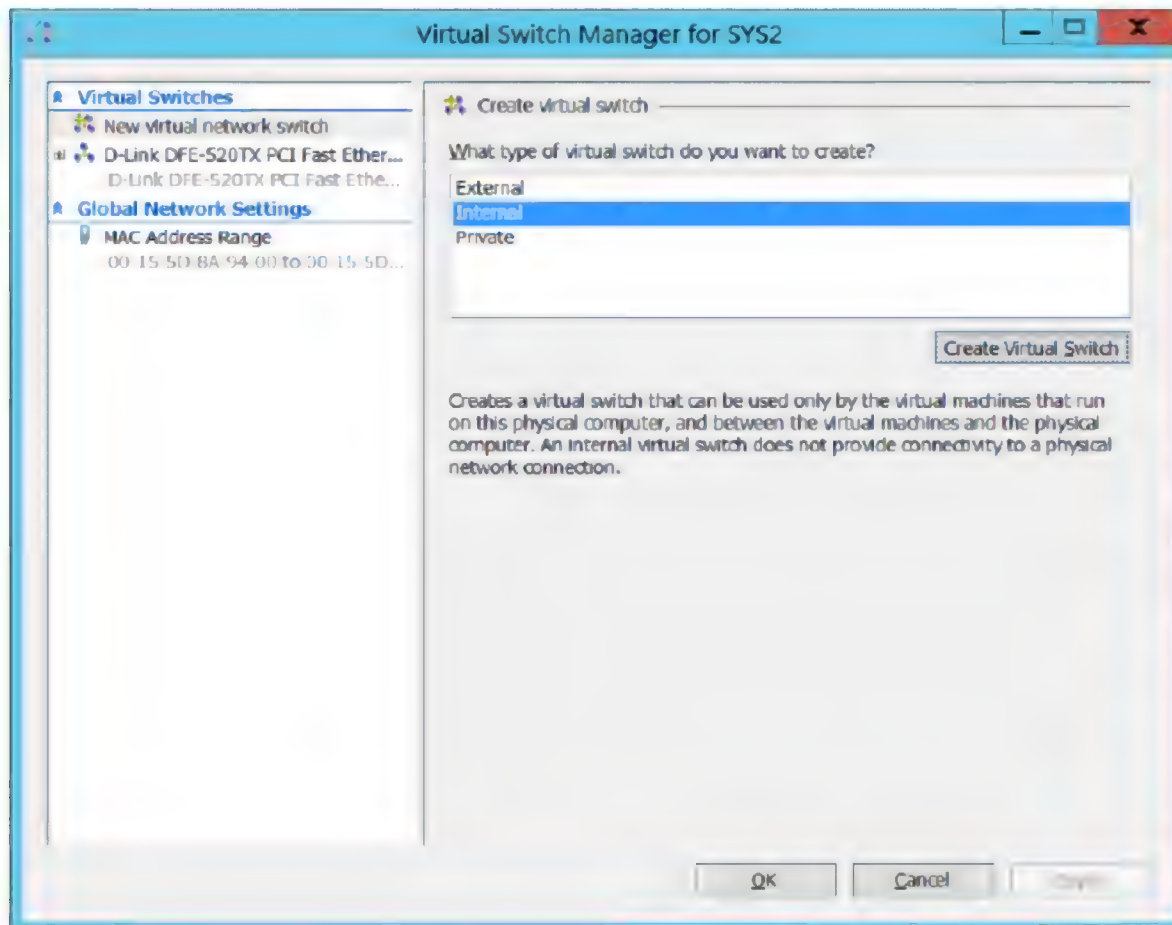


2. In Hyper-V Manager, right click Server(SYS1) and select **Virtual Switch Manager**.

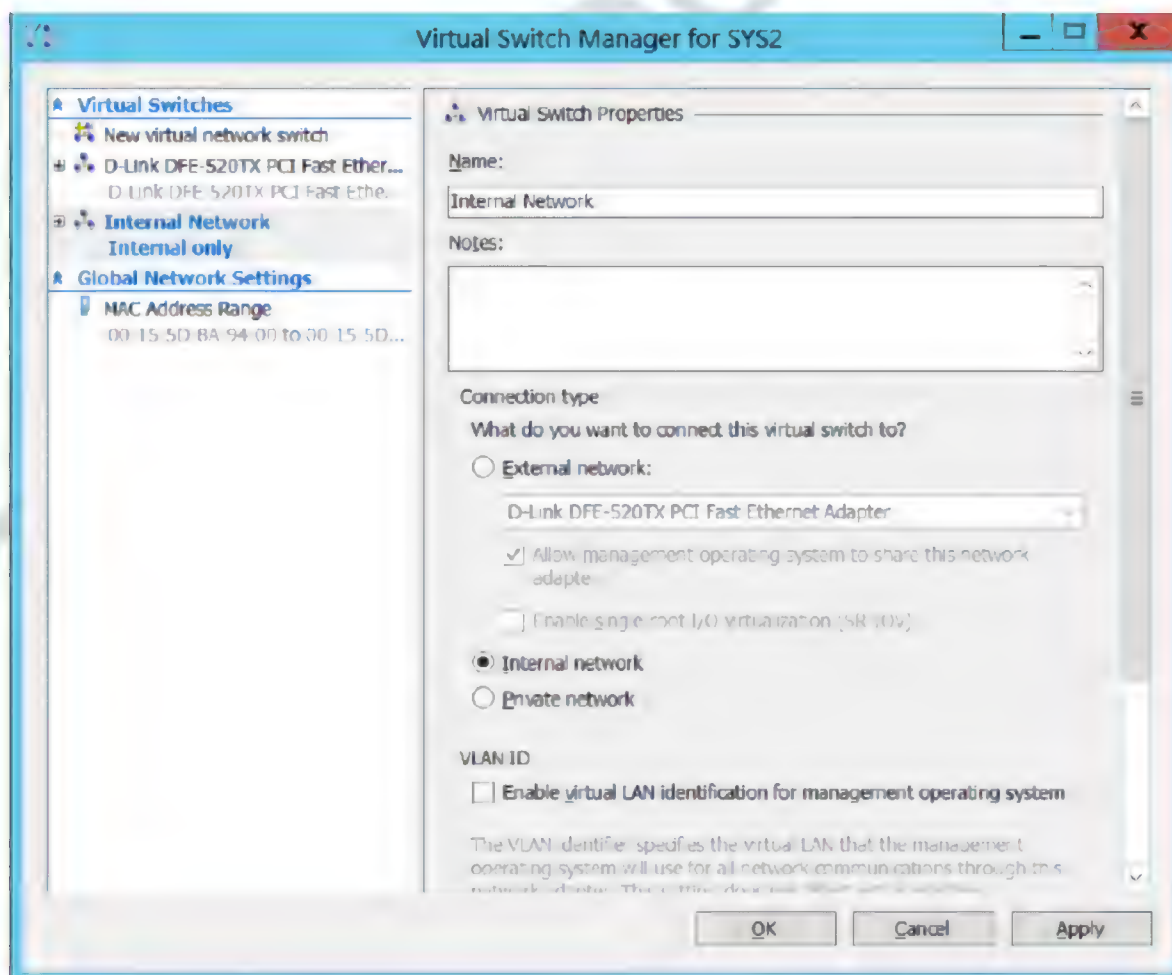


Displays the Virtual Switch Manager user interface.

3. In Virtual Switch Manager Page, select New virtual network switch, select **Internal**, and click **Create Virtual Switch**.

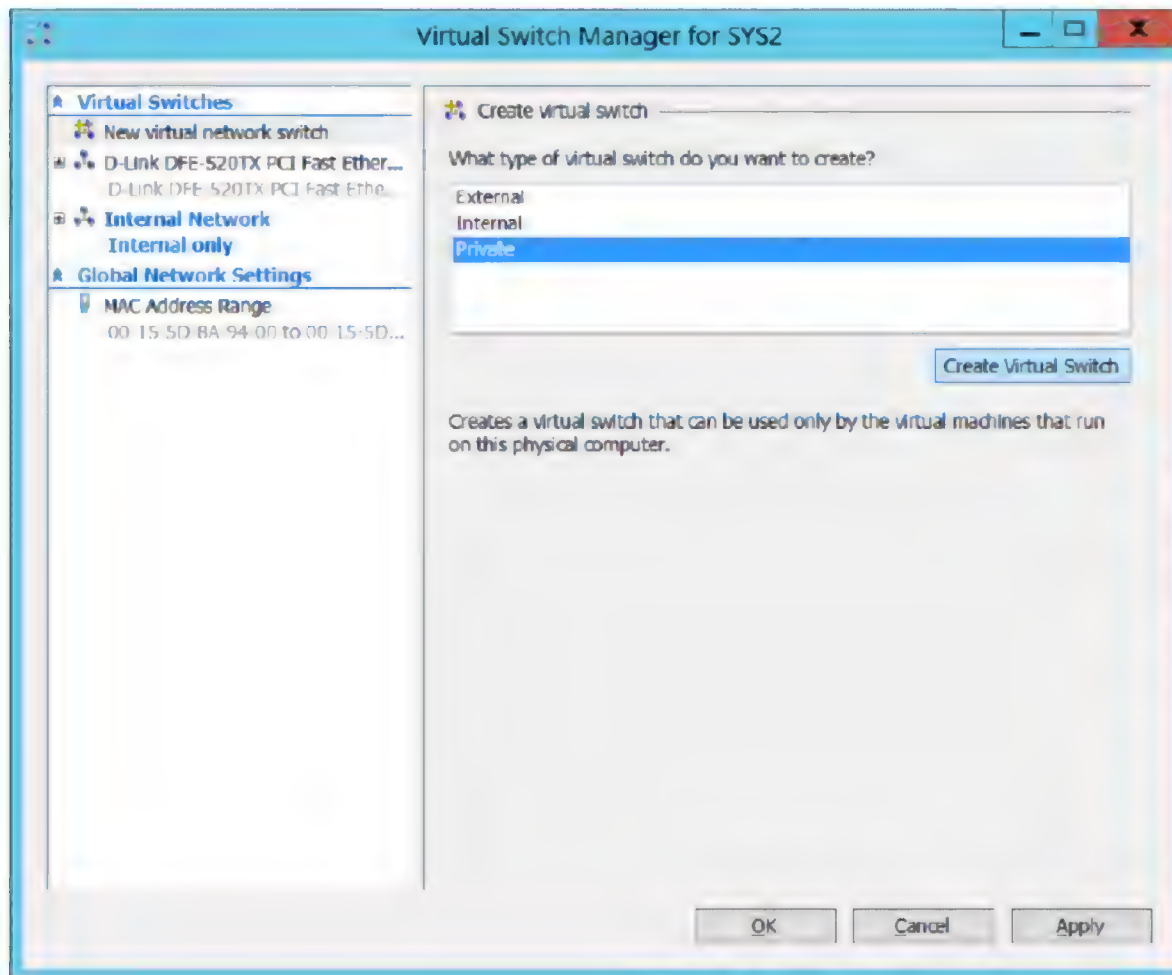


4. Select Internal Network, enter the Name (Ex: Internal Network) and in Connection type select Internal network, click **OK**.

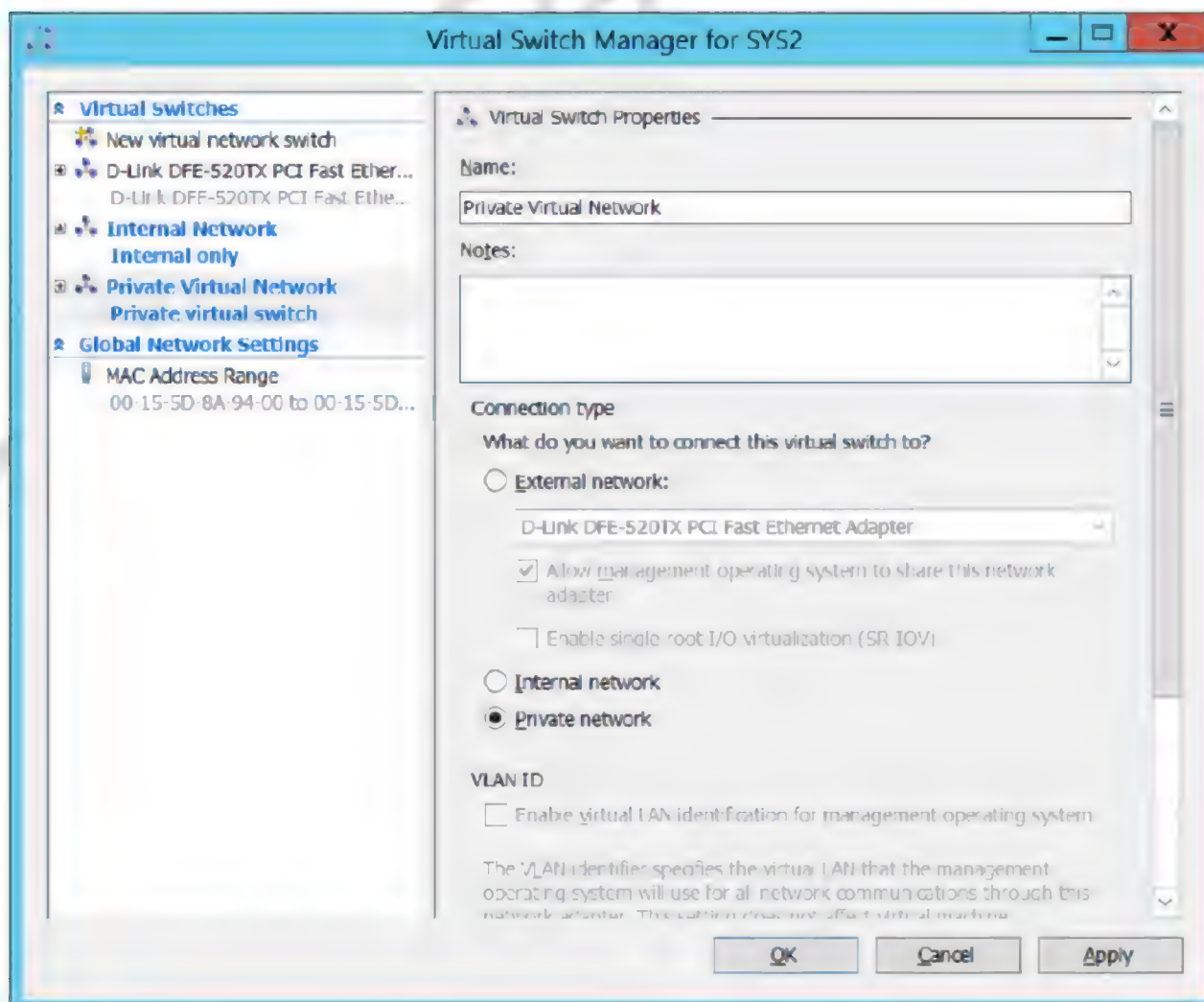




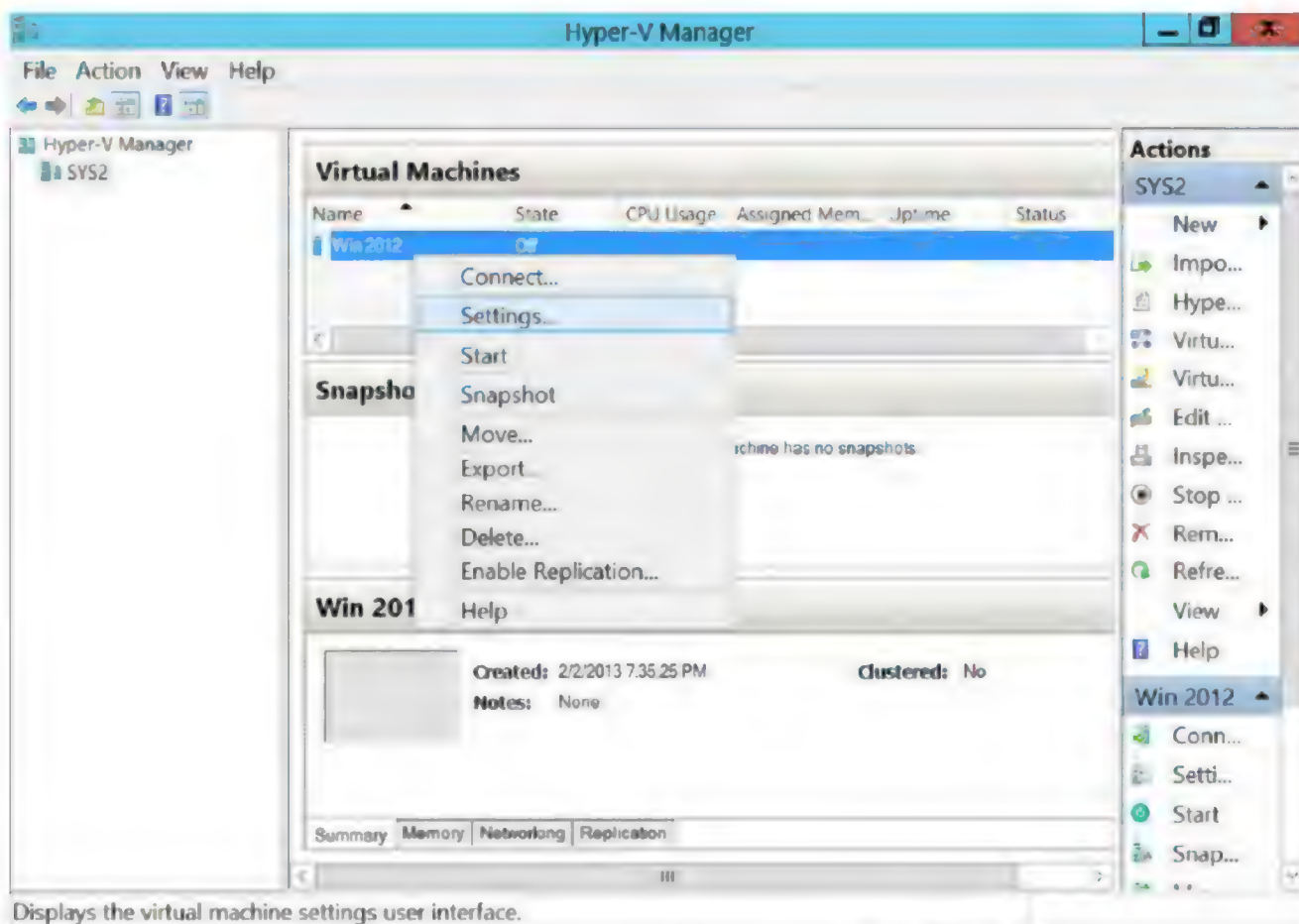
5. In Virtual Switch Manager Page, select New virtual network switch, select **Private**, and click **Create Virtual Switch**.



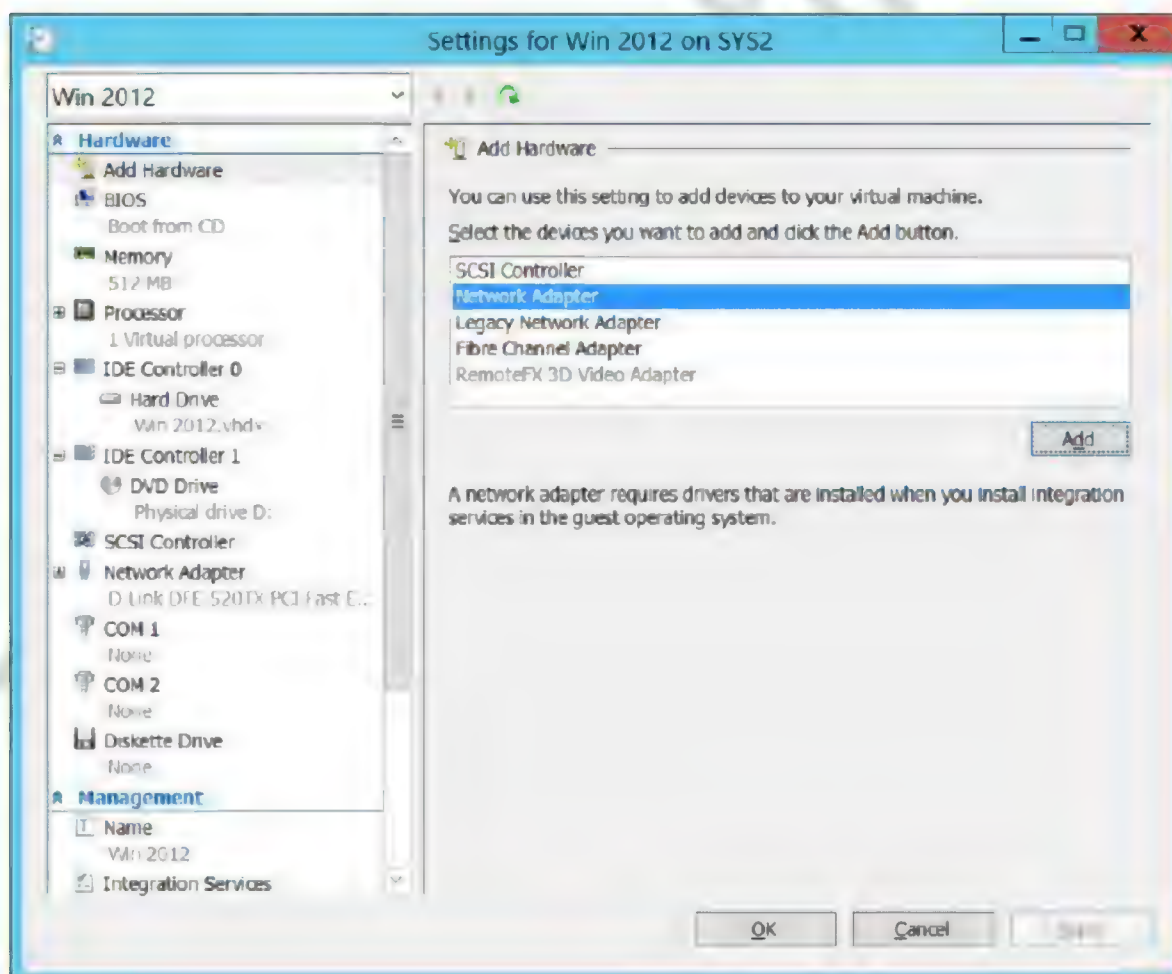
6. Select Private Virtual Network, enter the Name (Ex: Private Virtual Network) and in Connection type select Private network, click **OK**.



7. Go to Hyper-V Manager, right click Virtual Machine (Ex: win 2012) select **Settings**.

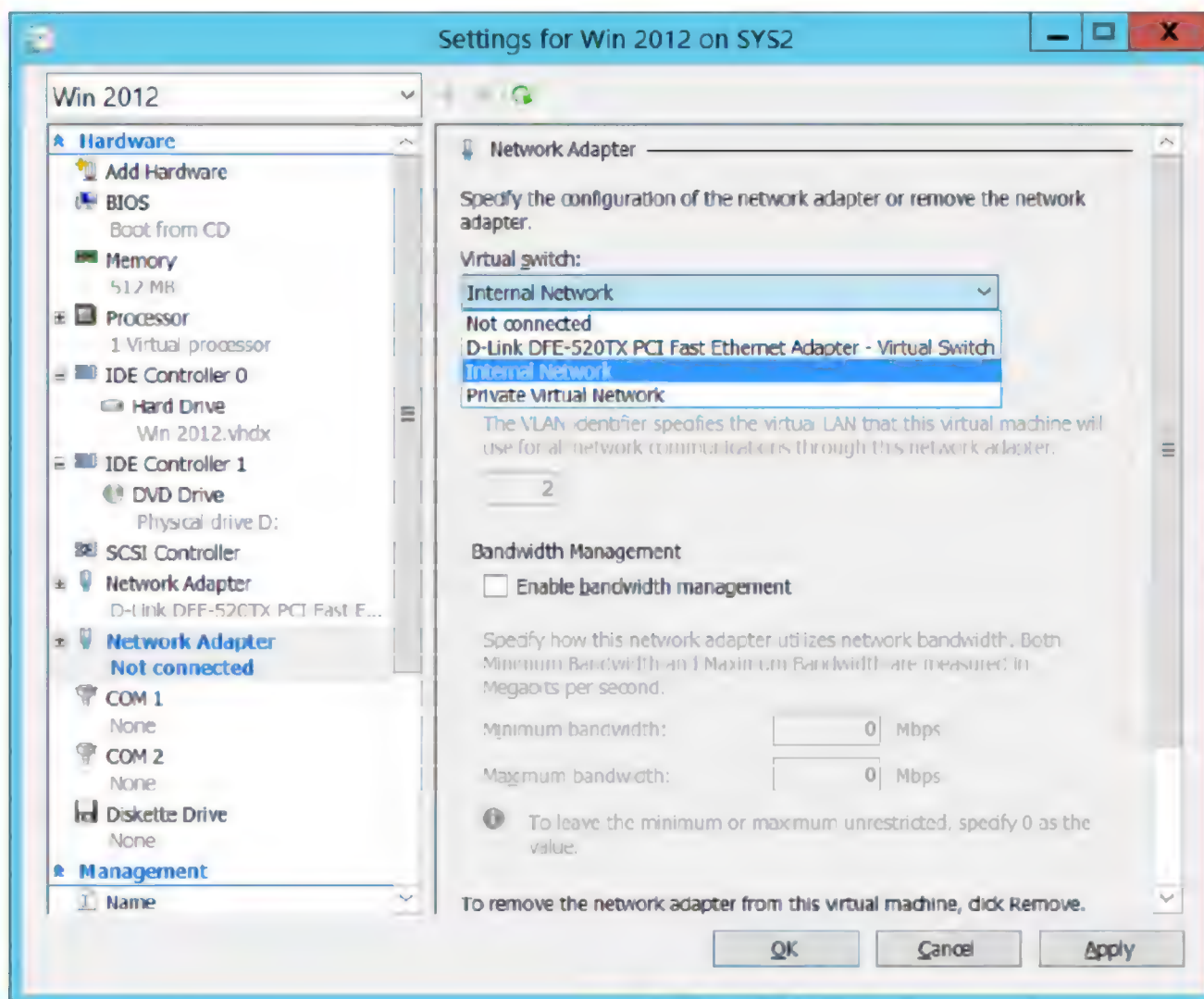


8. Select Add Hardware, select Network Adapter, and click **Add**.

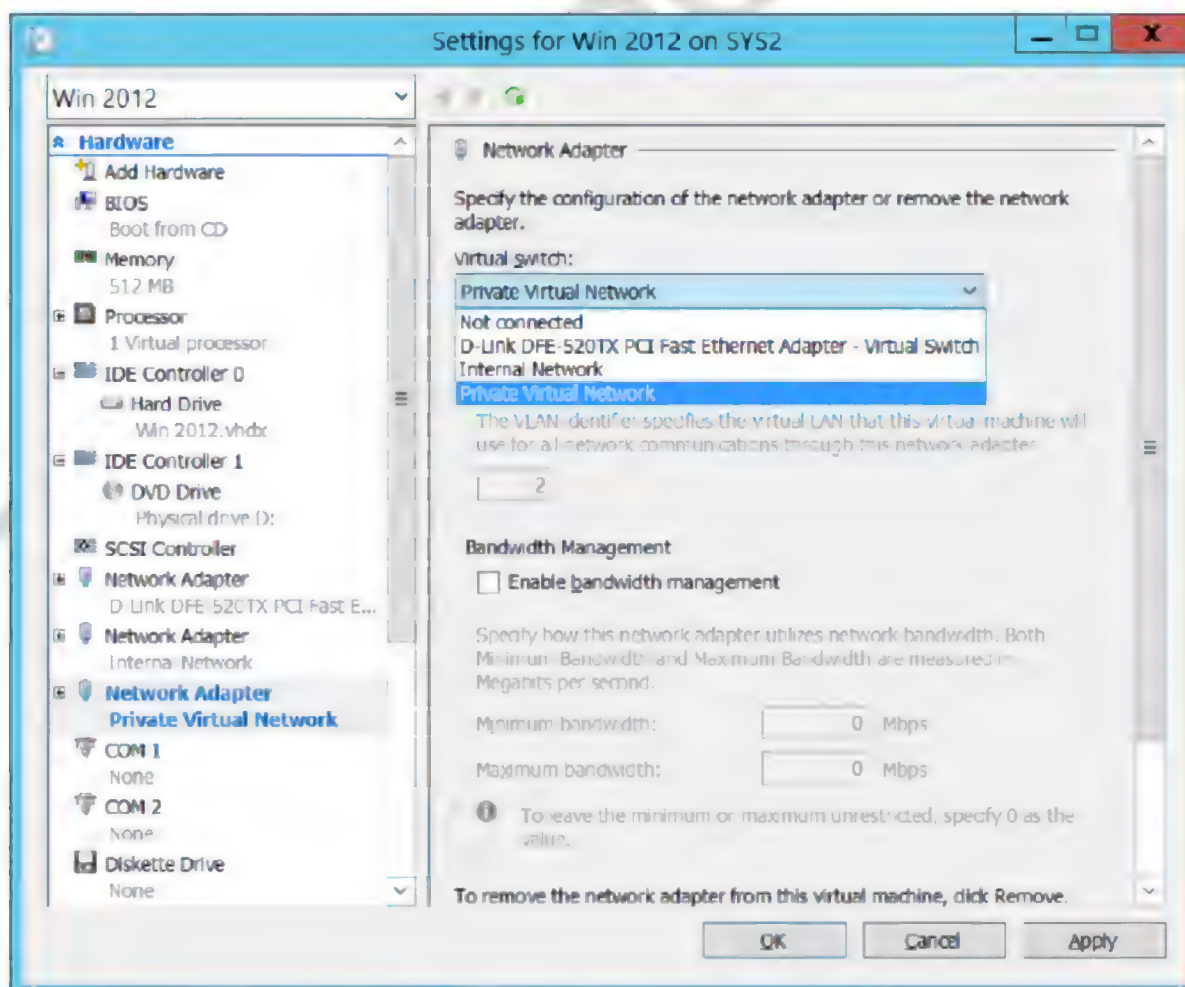




9. Select Network Adapter and select **Internal Network**.



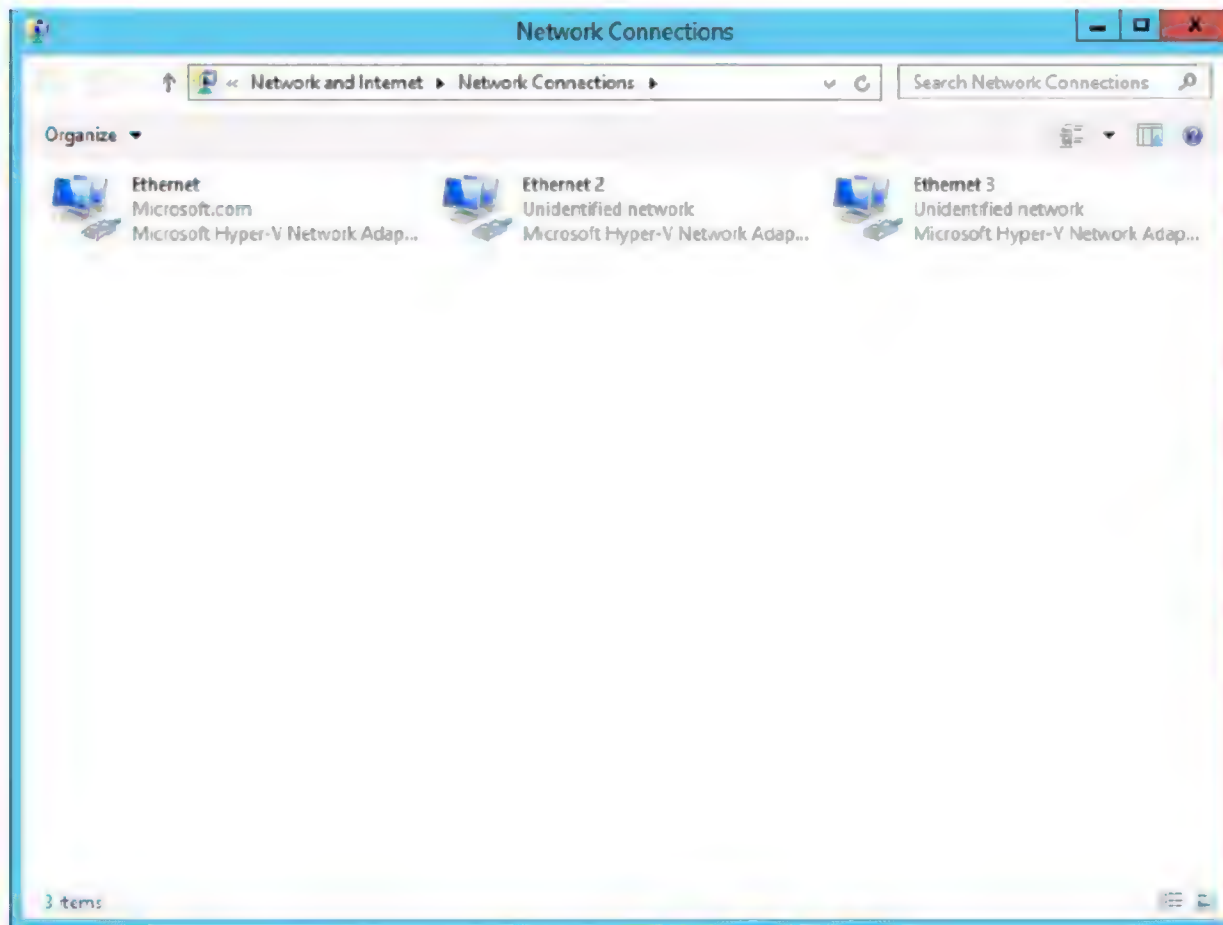
10. Select Network Adapter and select **Private Virtual Network**.



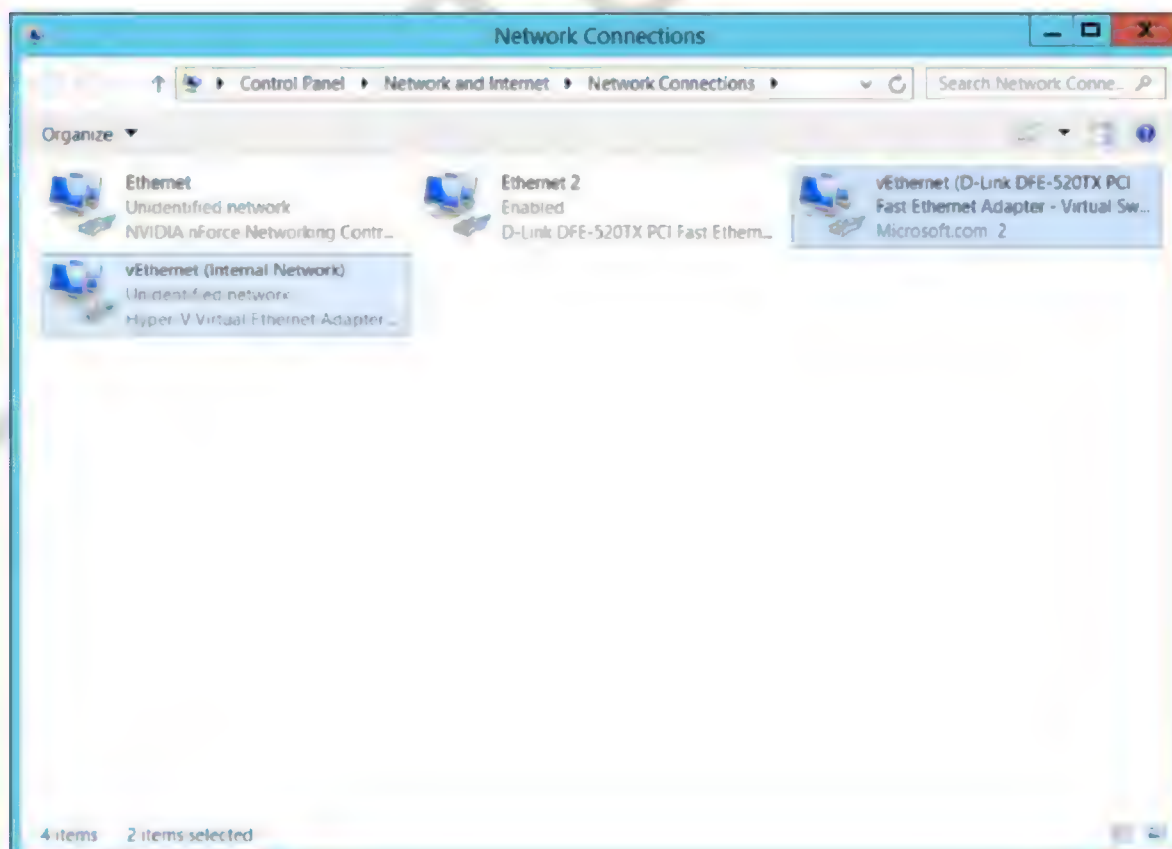


**Verification:**

1. Log on to Virtual Machine, go to Network Connection and verify for 3 network adapters External, Internal and Private Virtual Networks respectively.



2. Go to Network connection on Host machine and verify 2 virtual network adapters connected to External and Internal networks respectively.



## Lab – 70: Configuring Hyper-V Replica

### Objective:

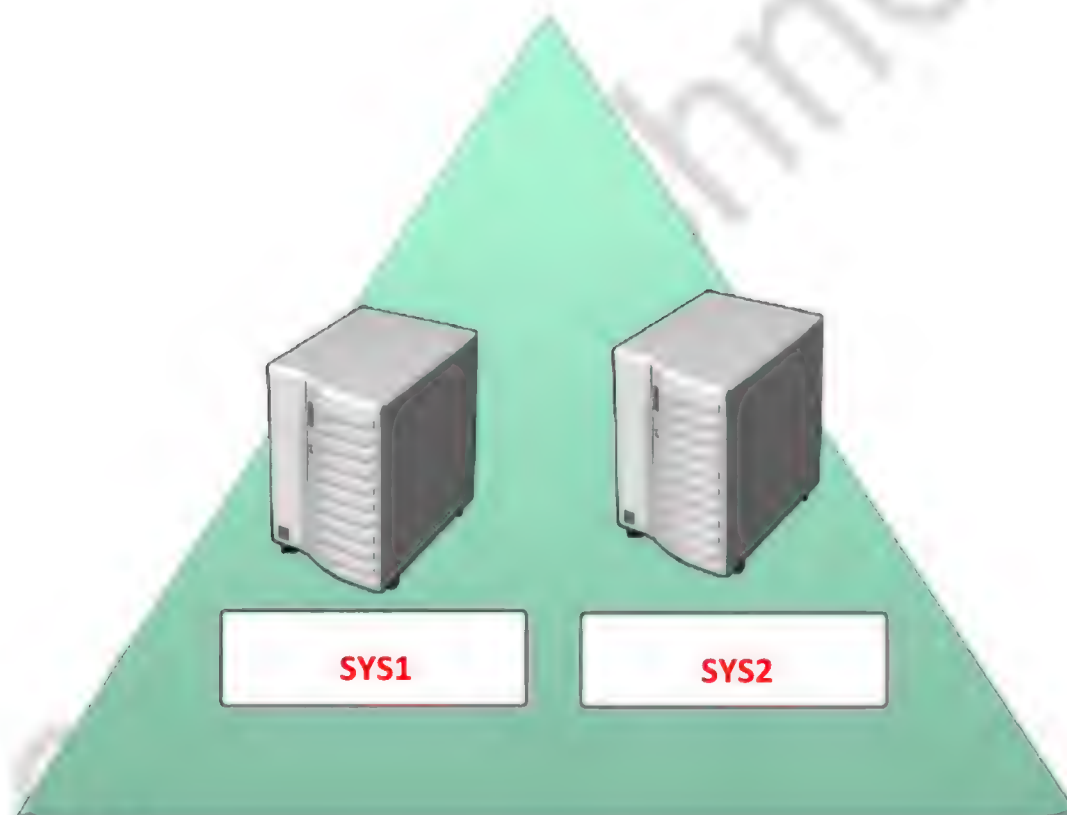
To configure high availability of virtual machines using Hyper-V replica

### Pre-requisites:

Before working on this lab, you must have

- A Computer with Windows Server 2012 Operating System domain controller/Hyper-V host.
- A member server running windows server 2012 Hyper-V host.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller / Hyper-V

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### sys2

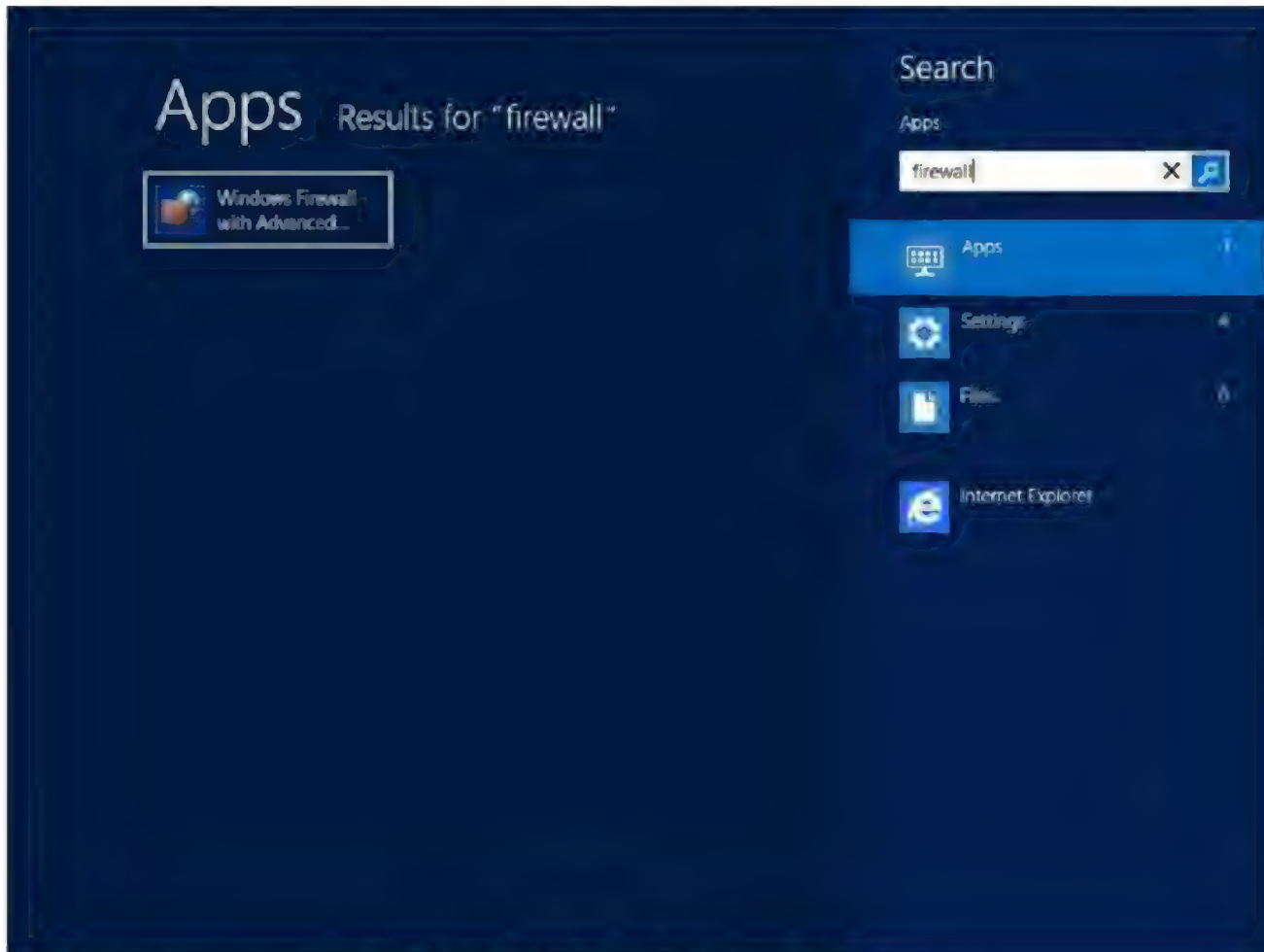
##### member server / Hyper-V

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred Dns	10.0.0.1

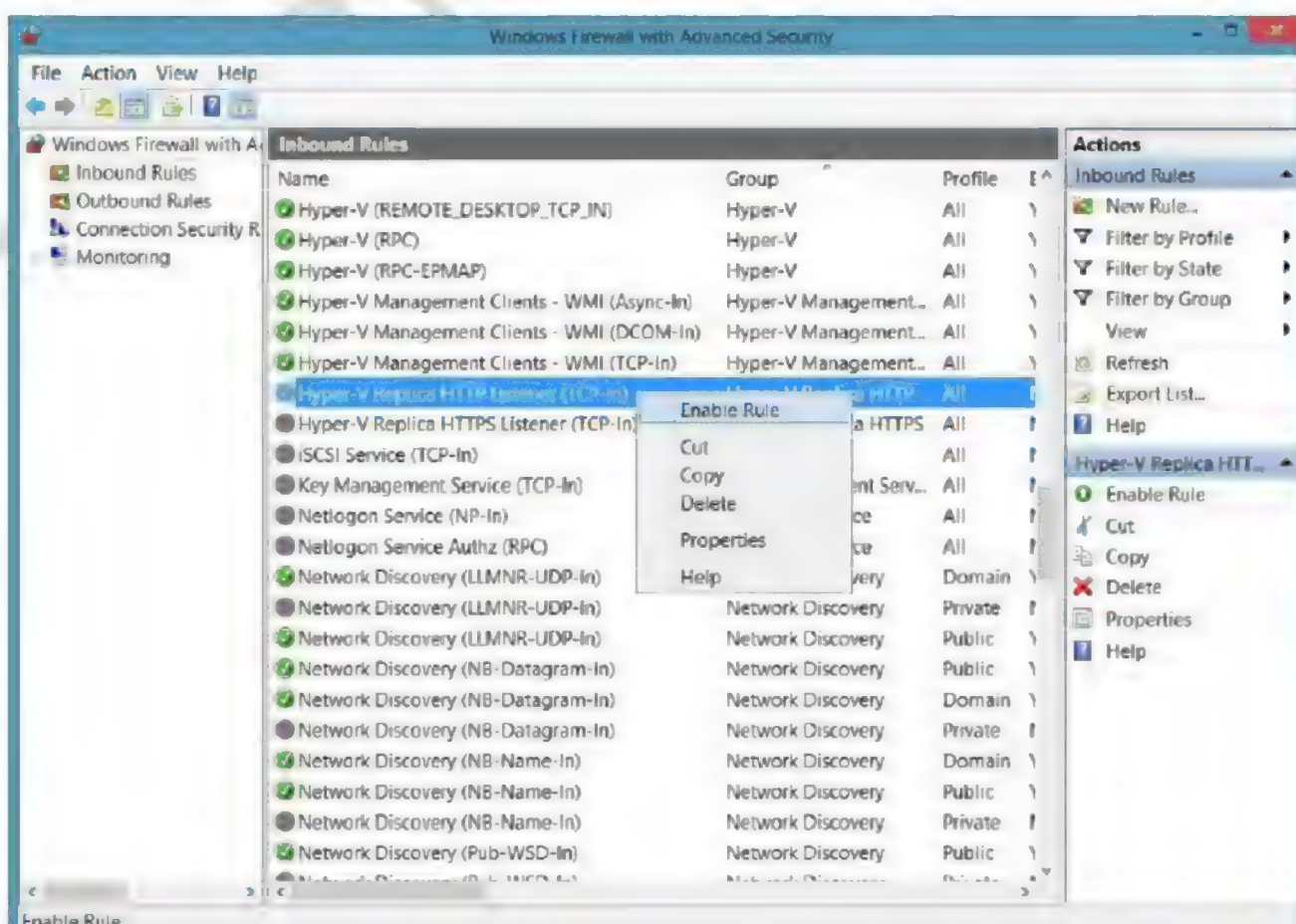
**Steps:**

**SYS2 – CONFIGURATION**

1. Log on to Member Server **SYS2** as Domain Administrator and Install Hyper-V.
2. Go to Start, type Firewall, select **Windows Firewall with Advanced...**



3. Select Inbound Rules, Right click **Hyper-V Replica HTTP Listener (TCP-In)**, **Enable Rule** and **Hyper-V Replica HTTPS Listener (TCP-In)** and **Enable Rule**.

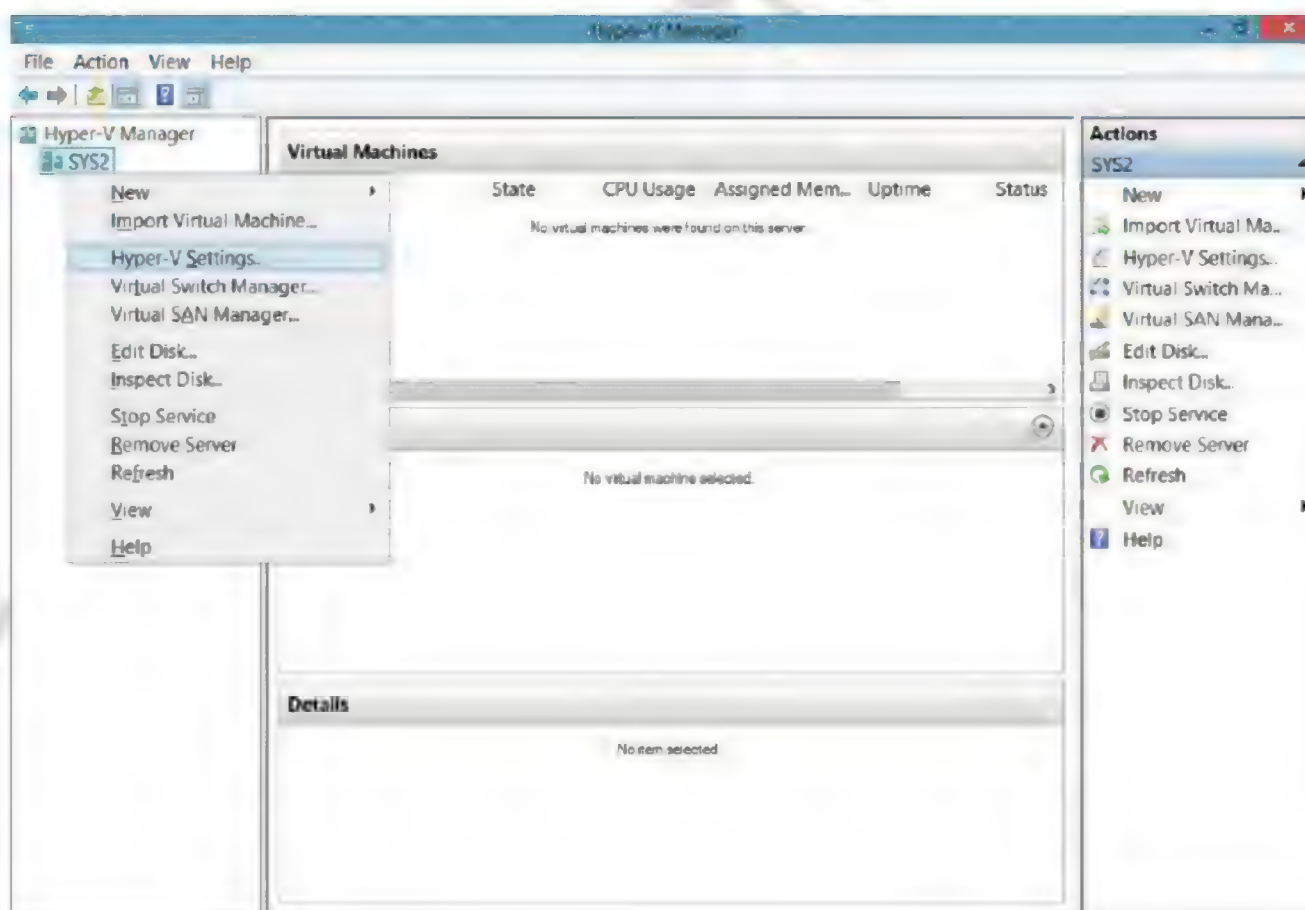




4. Go to Start, select **Hyper-V Manager**.

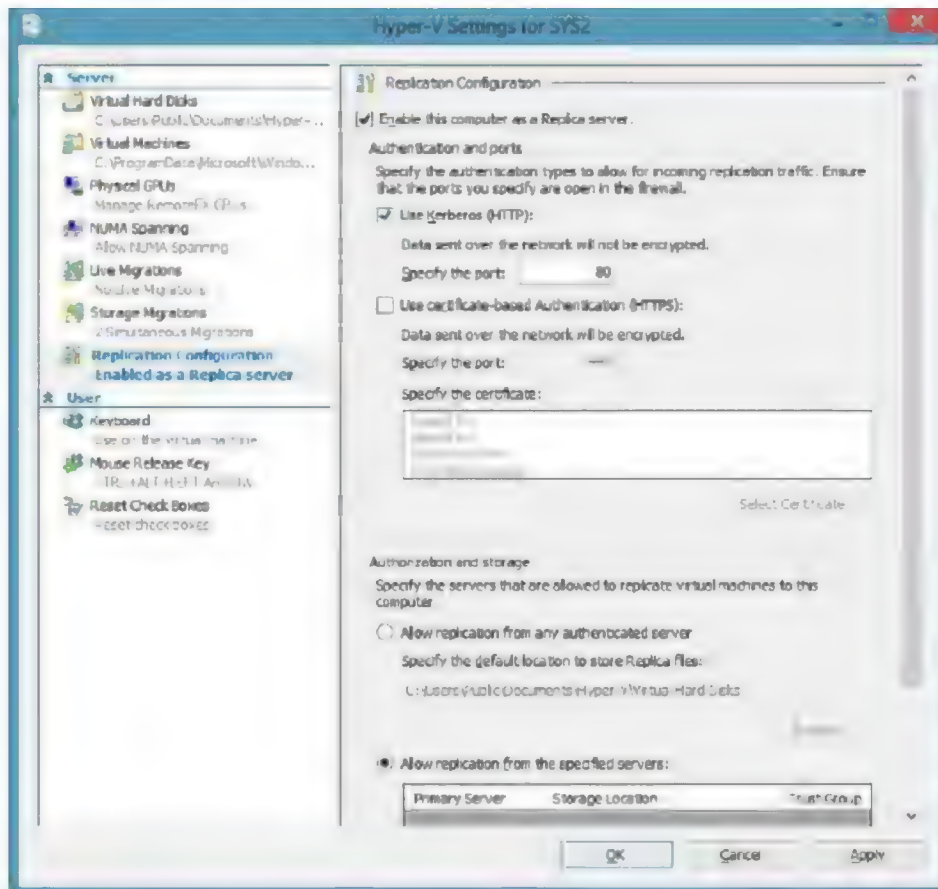


5. In Hyper-V Manager, right click on Server Name (**SYS2**) and select **Hyper-V Settings**

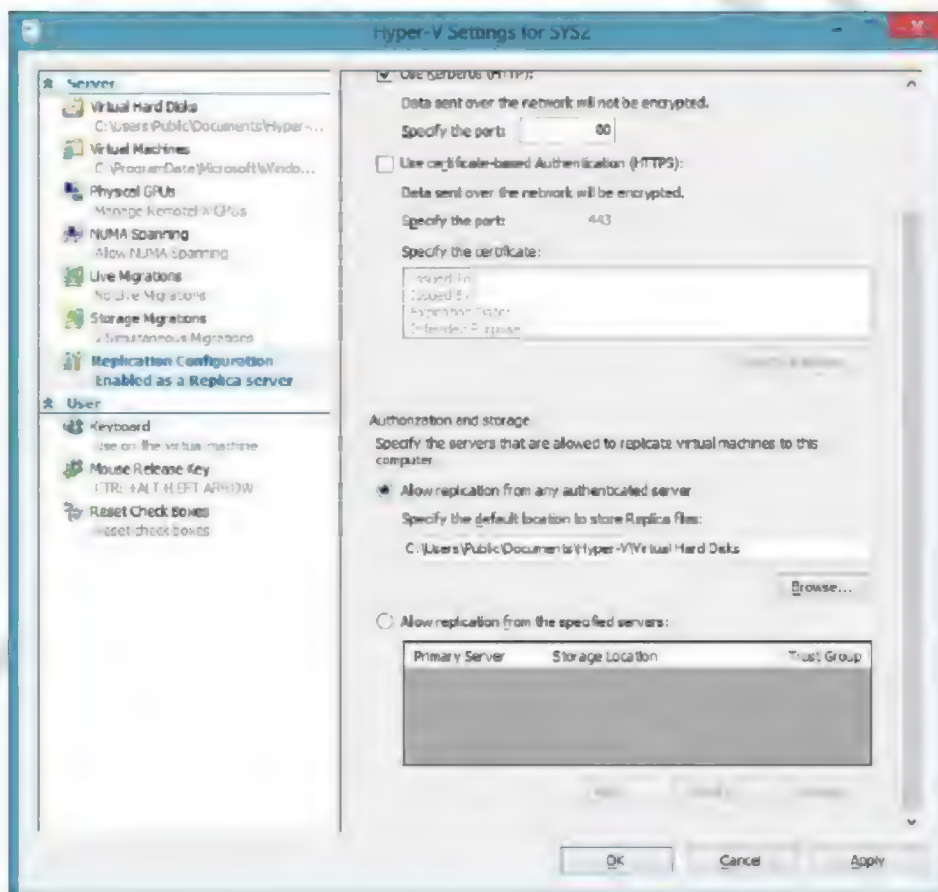


Launches the Hyper-V settings user interface.

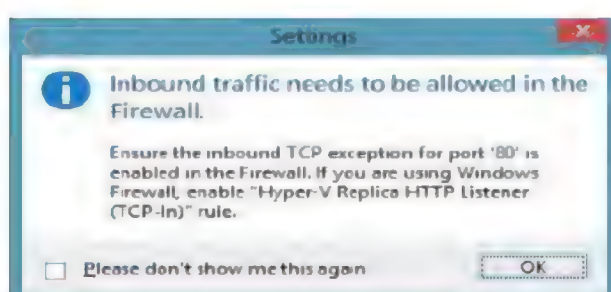
6. Select Replication Configuration, check box **Enable this Computer as a Replica server** and check **Use Kerberos (HTTP)**



7. In Authorization, select **Allow replication from any authenticated server**



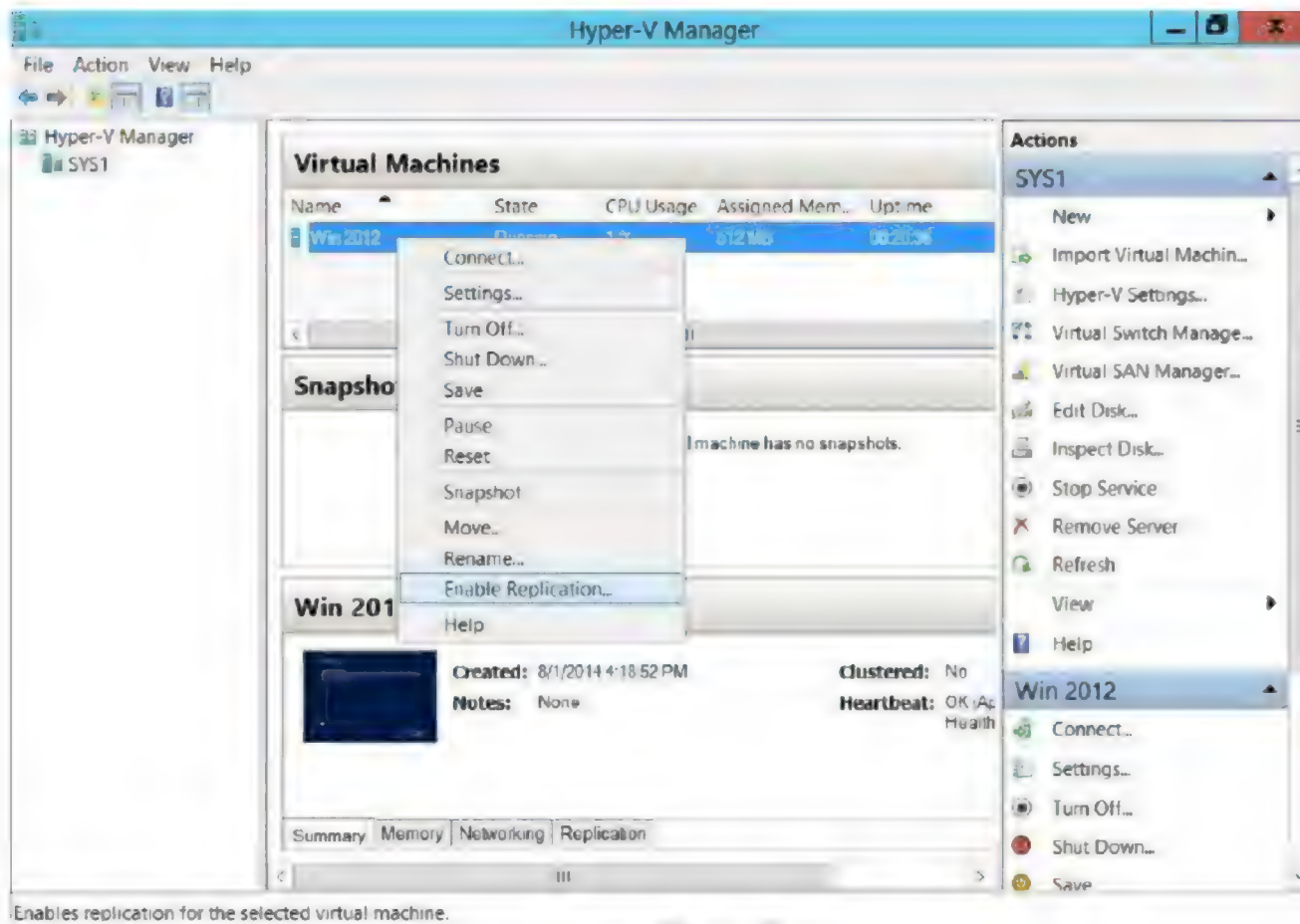
8. Click **OK**.





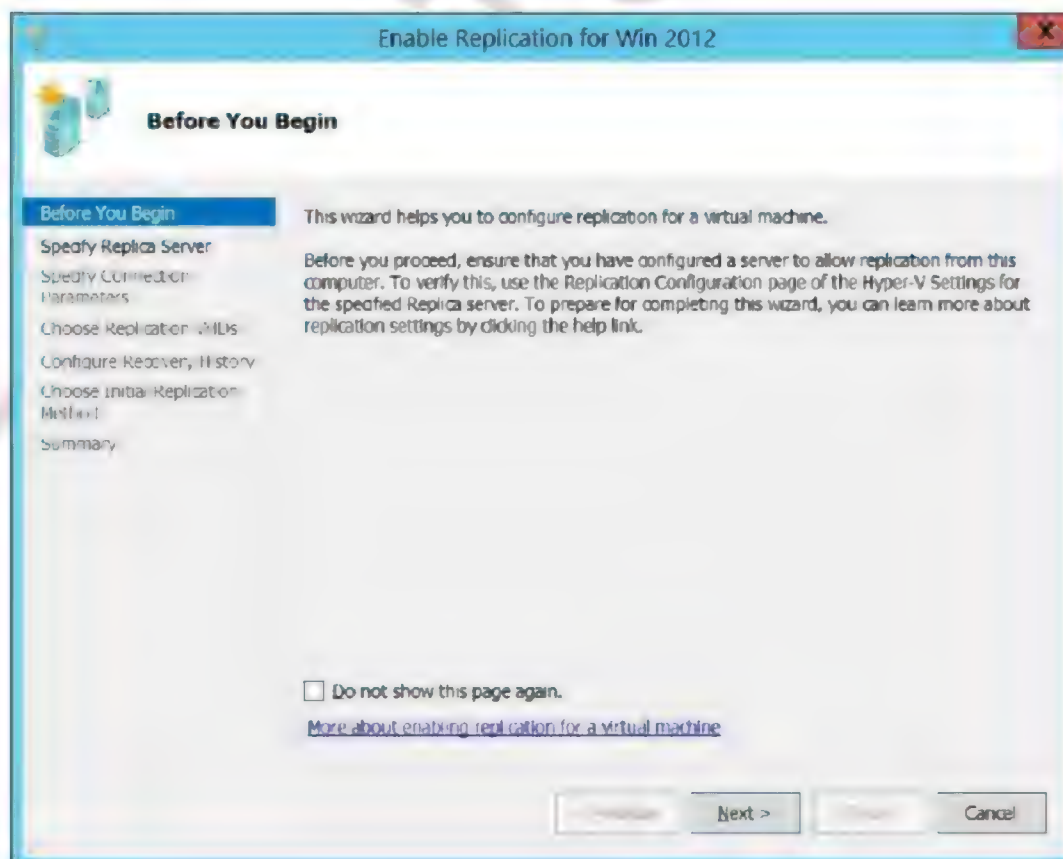
## SYS1 – CONFIGURATION

1. Go to Start, Hyper-V Manager, right click on virtual machine (Win 2012) and select **Enable Replication**.



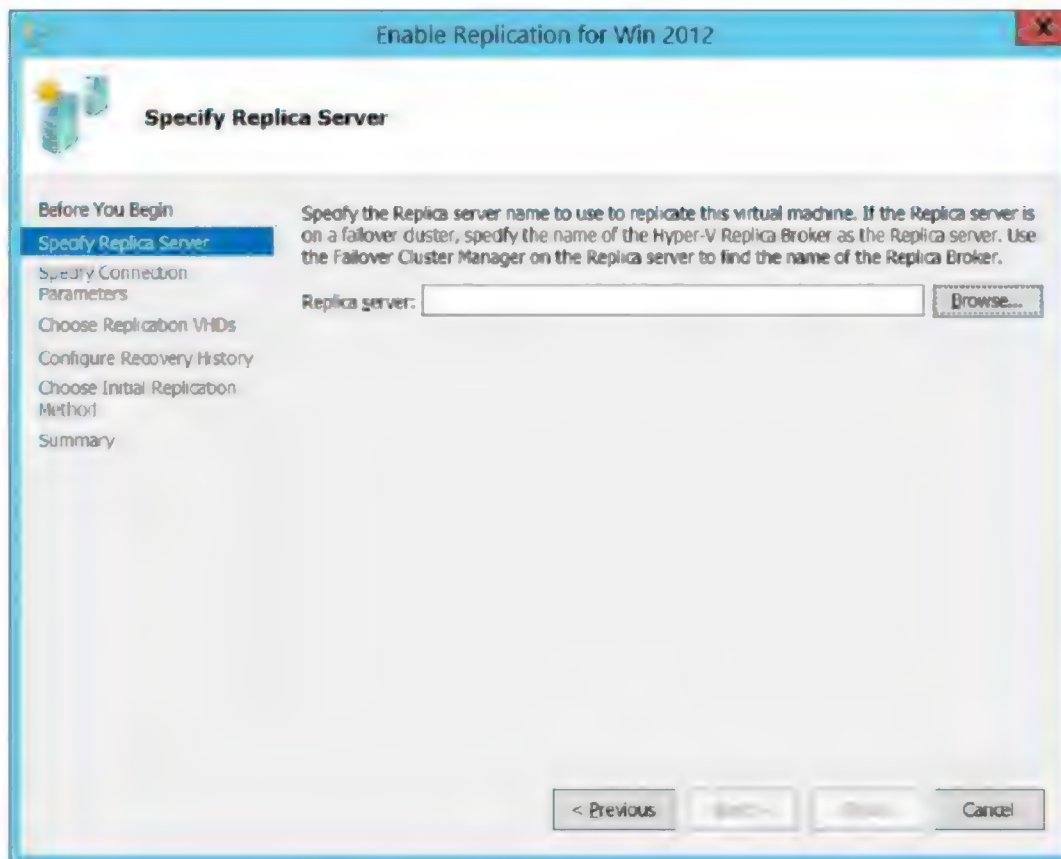
Enables replication for the selected virtual machine.

2. In Before you Begin Page, click **Next**.





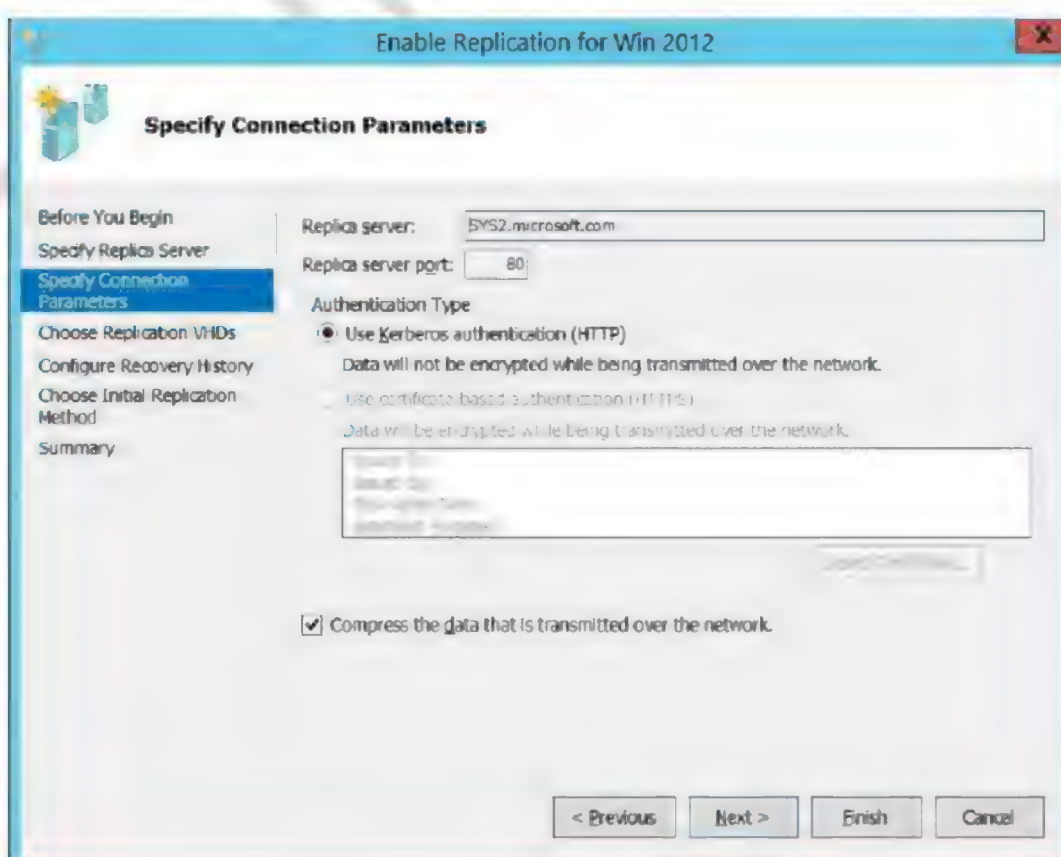
3. Click **Browse**.



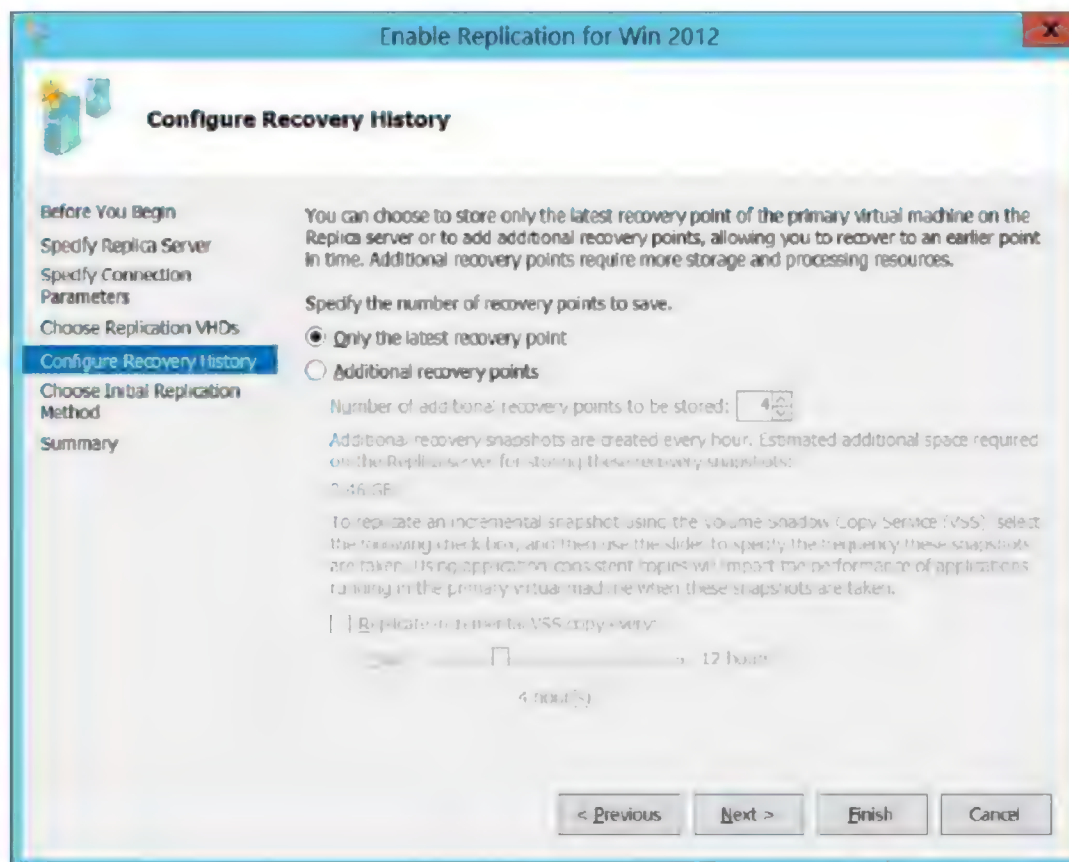
4. Enter the server name **SYS2**, click **OK**.



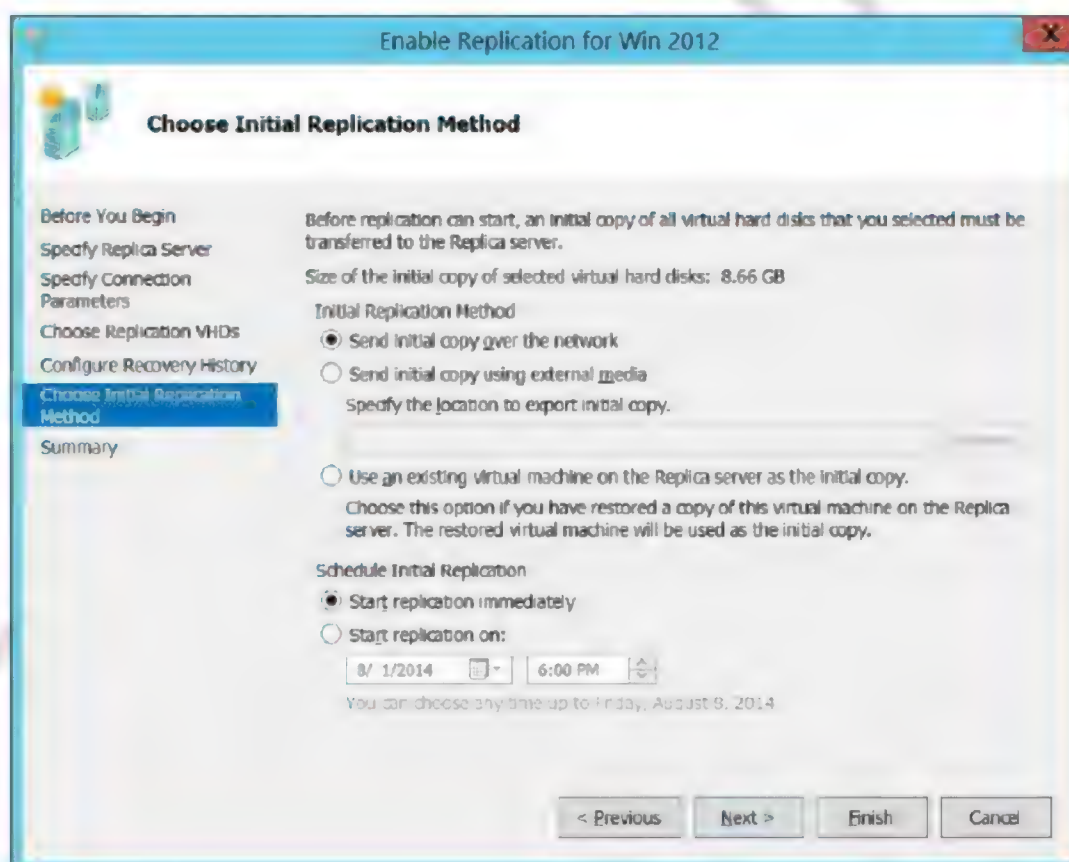
5. Click **Next**, accept the defaults click **Next**.



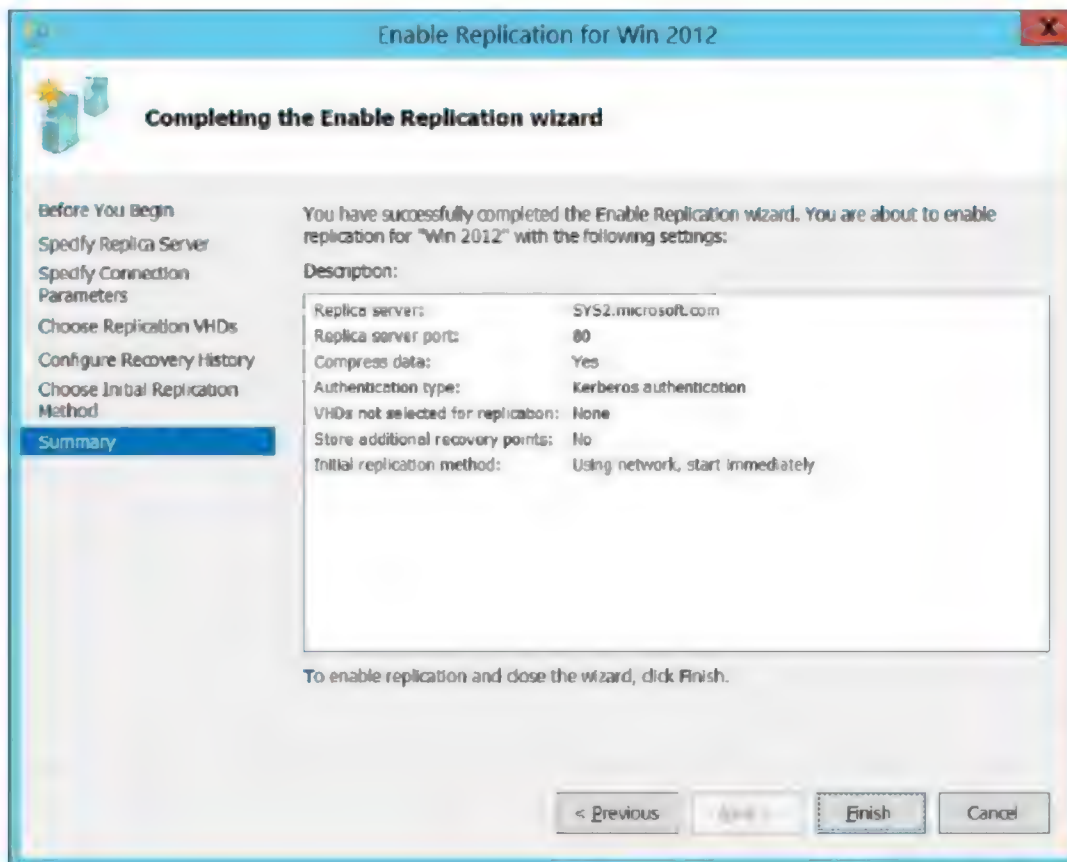
6. Click **Next**.



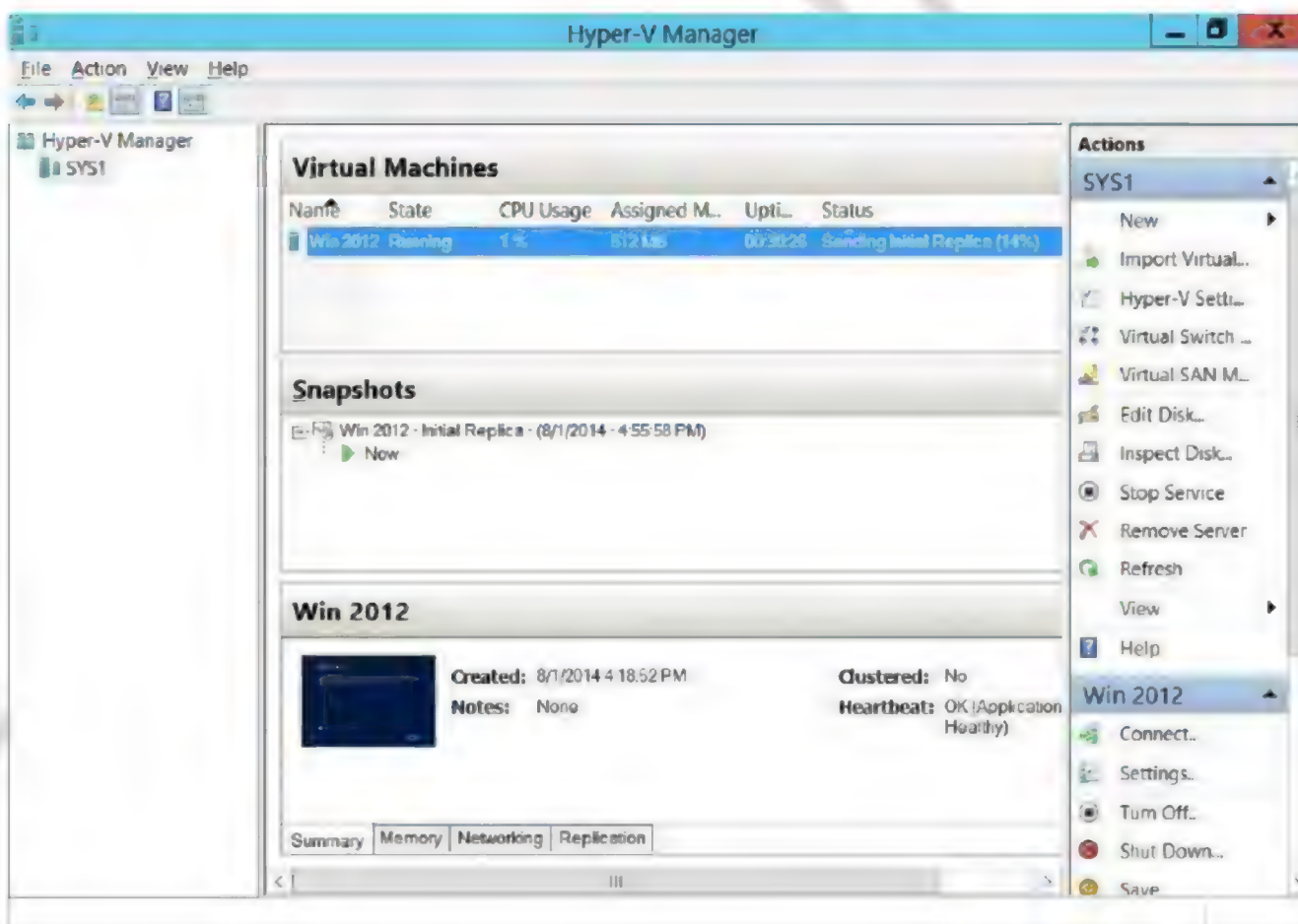
7. Select **Initial Replication Method**, click **Next**.



8. Click **Finish**.



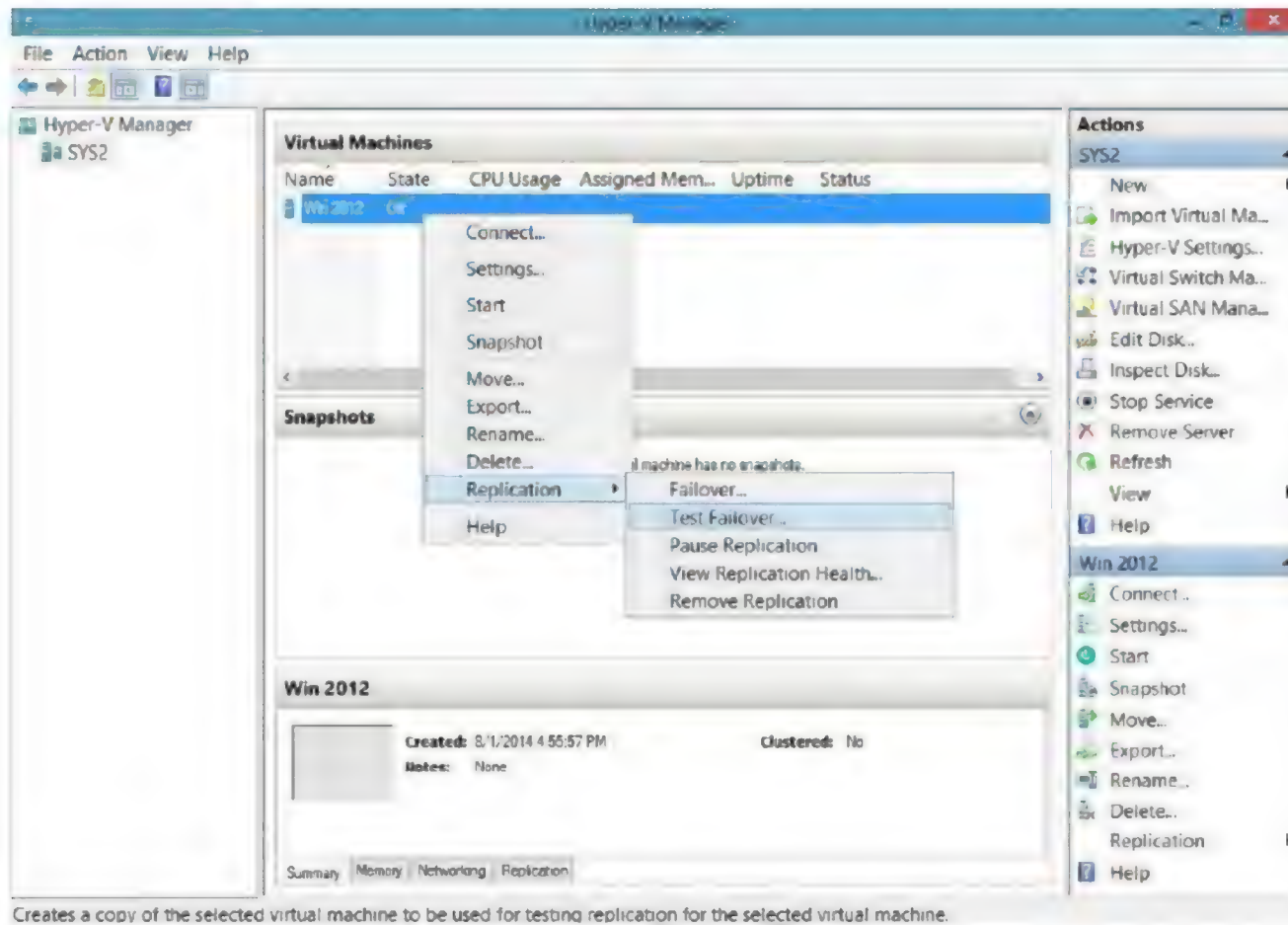
9. Verify for **Sending Initial Replication**.





**Verification:**

1. Go to Hyper-V Manager Console, and verify for replicated Virtual Machine.
2. To Test Failover, right on the virtual machine →select Replication and click Test Failover.



## Lab – 71: Installing and Configuring Routing

### Objective:

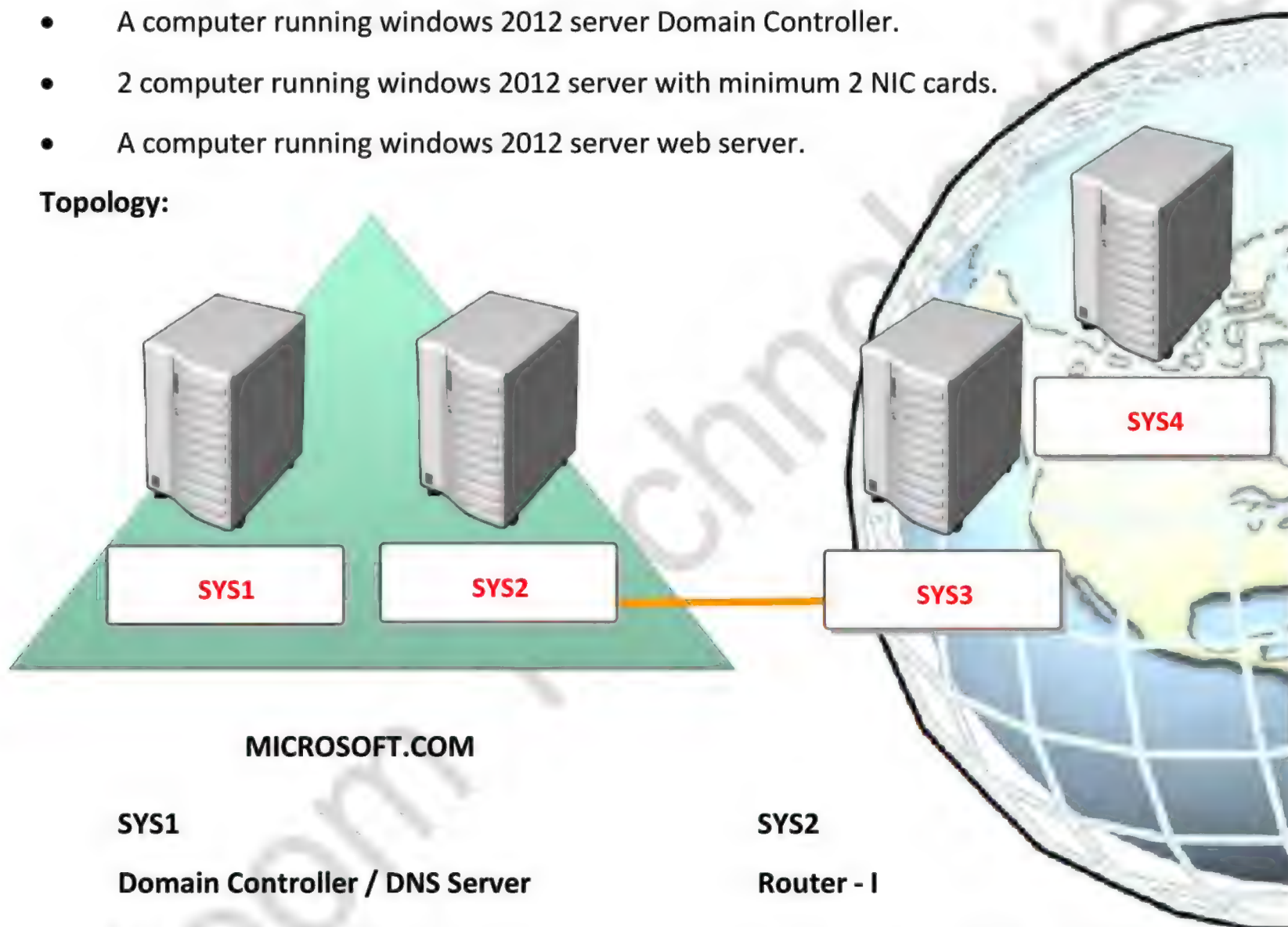
To configure software router using Windows Server 2012

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- 2 computer running windows 2012 server with minimum 2 NIC cards.
- A computer running windows 2012 server web server.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller / DNS Server

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Gateway	10.0.0.1
DNS Server	10.0.0.2, 12.0.0.2

#### SYS3

##### Router – II

IP Address	11.0.0.2,12.0.0.1
Subnet Mask	255.0.0.0
Gateway	-----
DNS Server	12.0.0.2

#### SYS2

##### Router - I

IP Address	10.0.0.1, 11.0.0.1
Subnet Mask	255.0.0.0
Gateway	-----
DNS Server	10.0.0.2

#### SYS4

##### Web server / DNS Server

IP Address	12.0.0.2
Subnet Mask	255.0.0.0
Gateway	12.0.0.1
DNS Server	12.0.0.2, 12.0.0.1

## Assigning the IP Address to Configure Routing

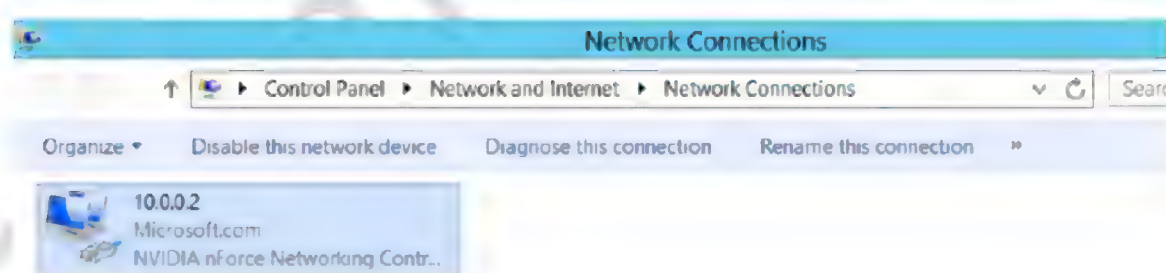
### ON PRIVATE:

1. Logon to **Private**.



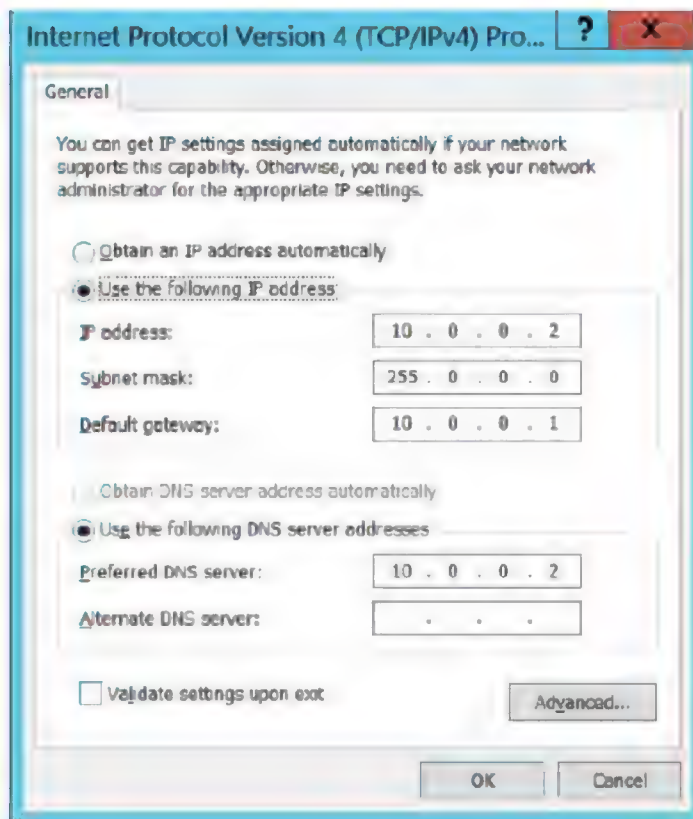
2. Check the IP settings:

Go Server Manager → Local Server → click 10.0.0.2, Right click **NIC card** → click **Properties**





3. Right click NIC card → click Properties → Internet Protocol Version4 (TCP/IPv4) → Properties → Define the IP address as mentioned below.



#### ON ROUTER 1:

1. Logon to **Router1**



## 2. Check the IP settings:

Go Server Manager → Local Server → click 10.0.0.1, Right click NIC card → click Properties  
→ Internet Protocol Version 4 (TCP/IPv4) → **Properties** → Define the IP address as mentioned below.



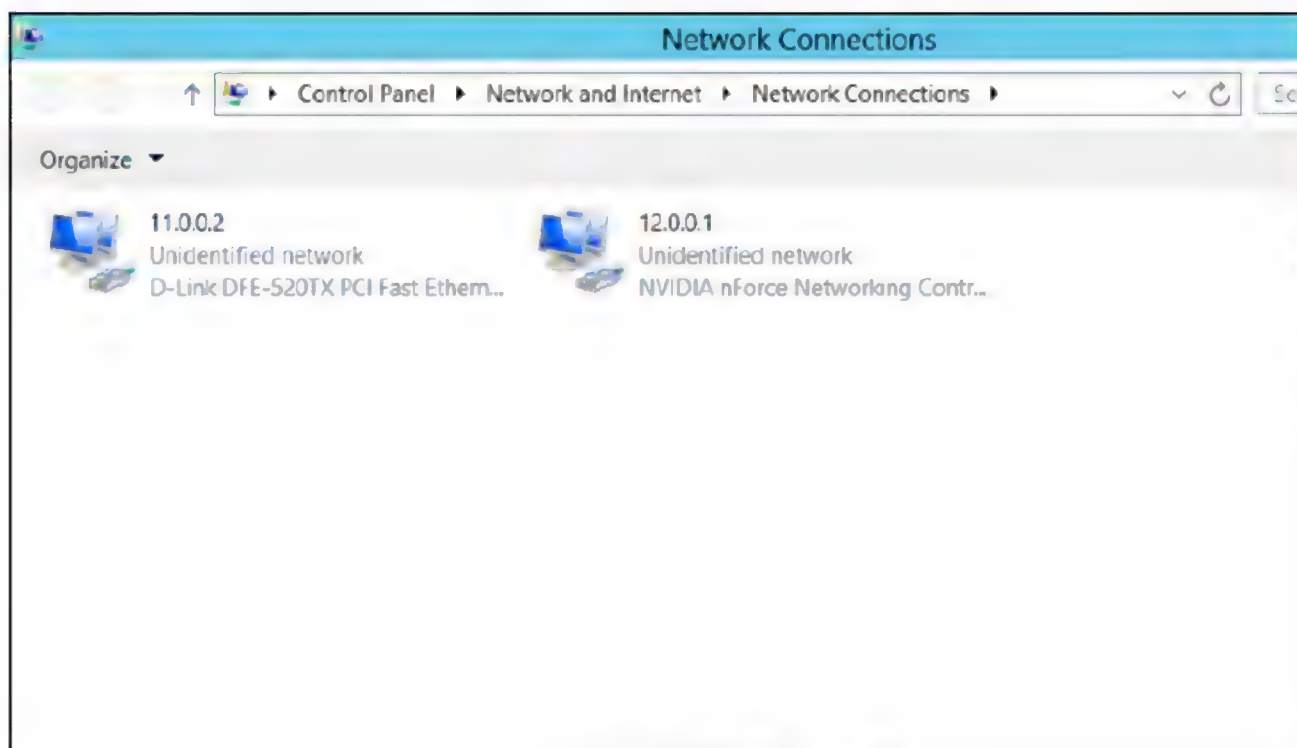
## On ROUTER 2:

### 1. Log on to **Router2**



2. **Check the IP settings:**

Go Server Manager → Local Server → click 11.0.0.2, Right click NIC card → click Properties  
→ Internet Protocol Version 4 (TCP/IPv4) → **Properties** → Define the IP address as mentioned  
below.



**On PUBLIC:**

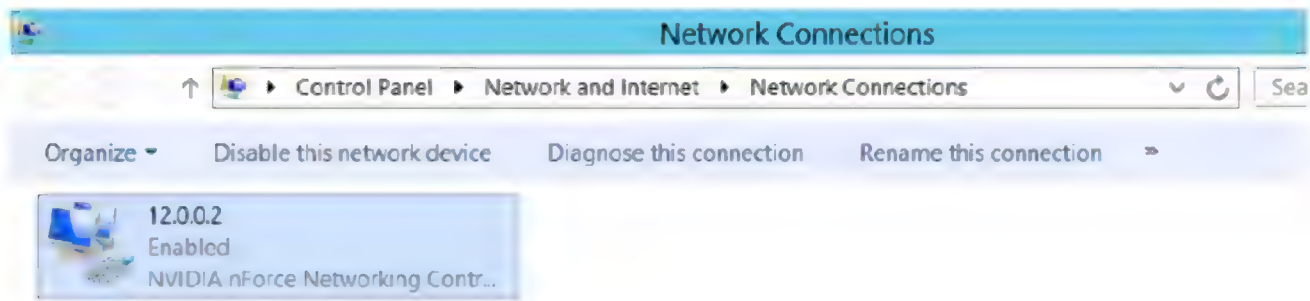
1. Logon to **Public**



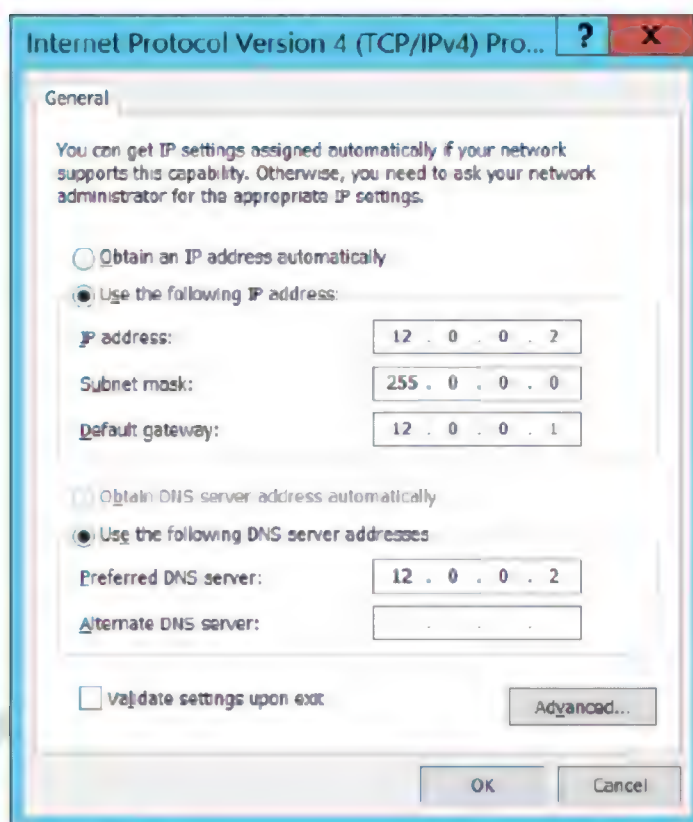


2. **Check the IP settings:**

Go Server Manager → Local Server → click 12.0.0.2,



3. Right click on NIC card → click Properties → Internet Protocol Version 4 (TCP/IPv4) → **Properties** → Define the IP address as mentioned below.



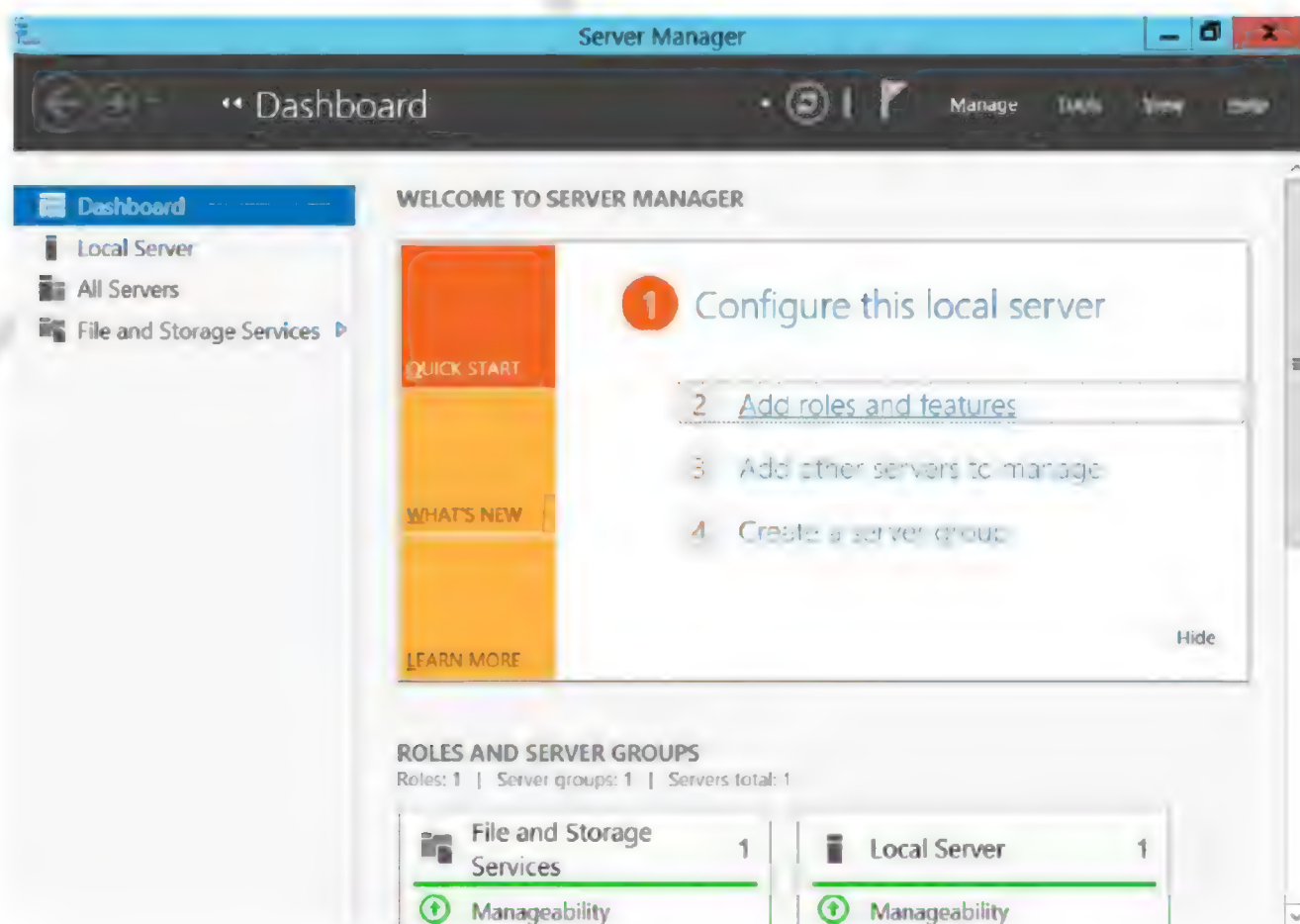
## Installing Routing Service on Router1 & Router2

### SYS2- CONFIGURATION

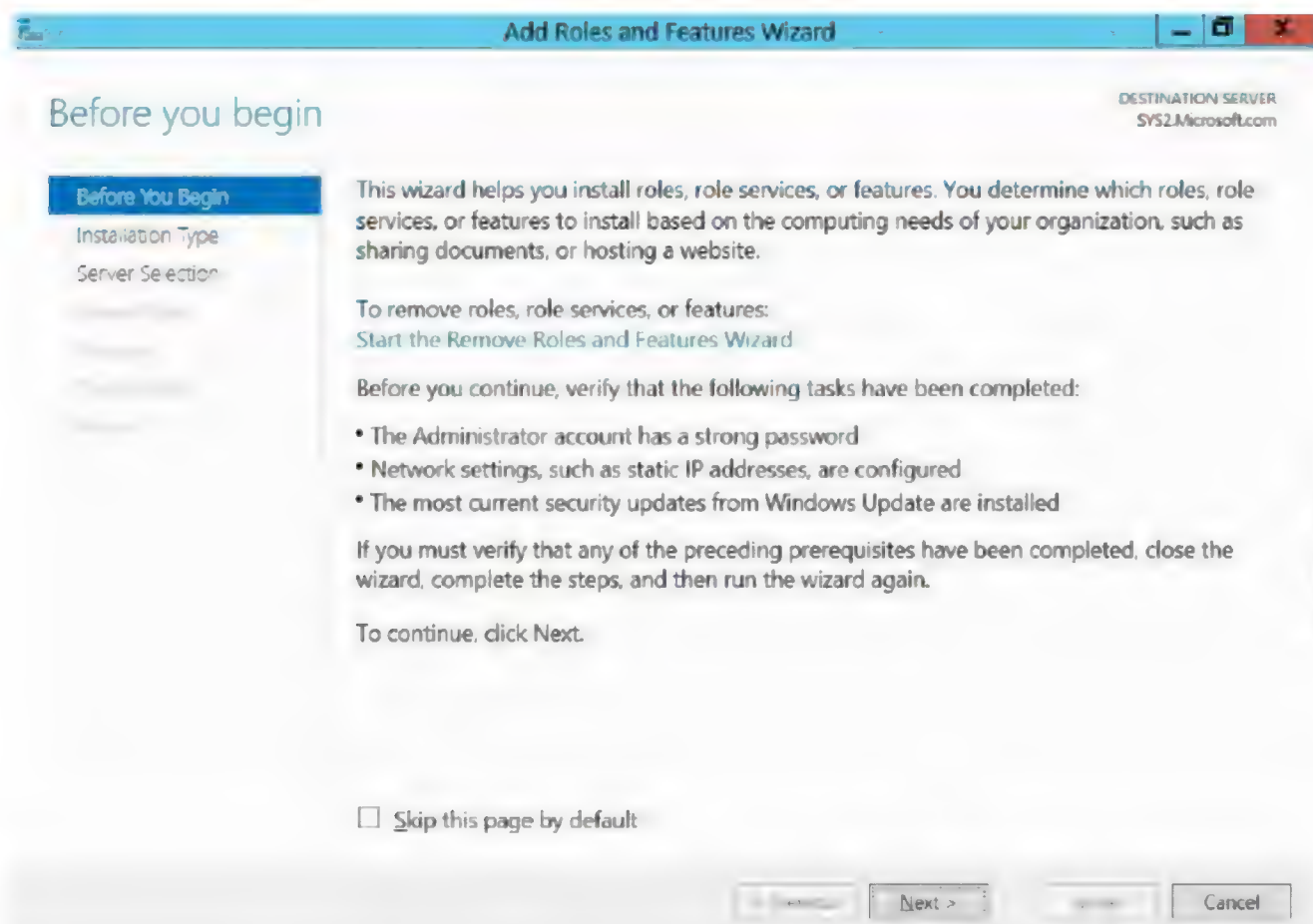
1. Click **Server Manager**



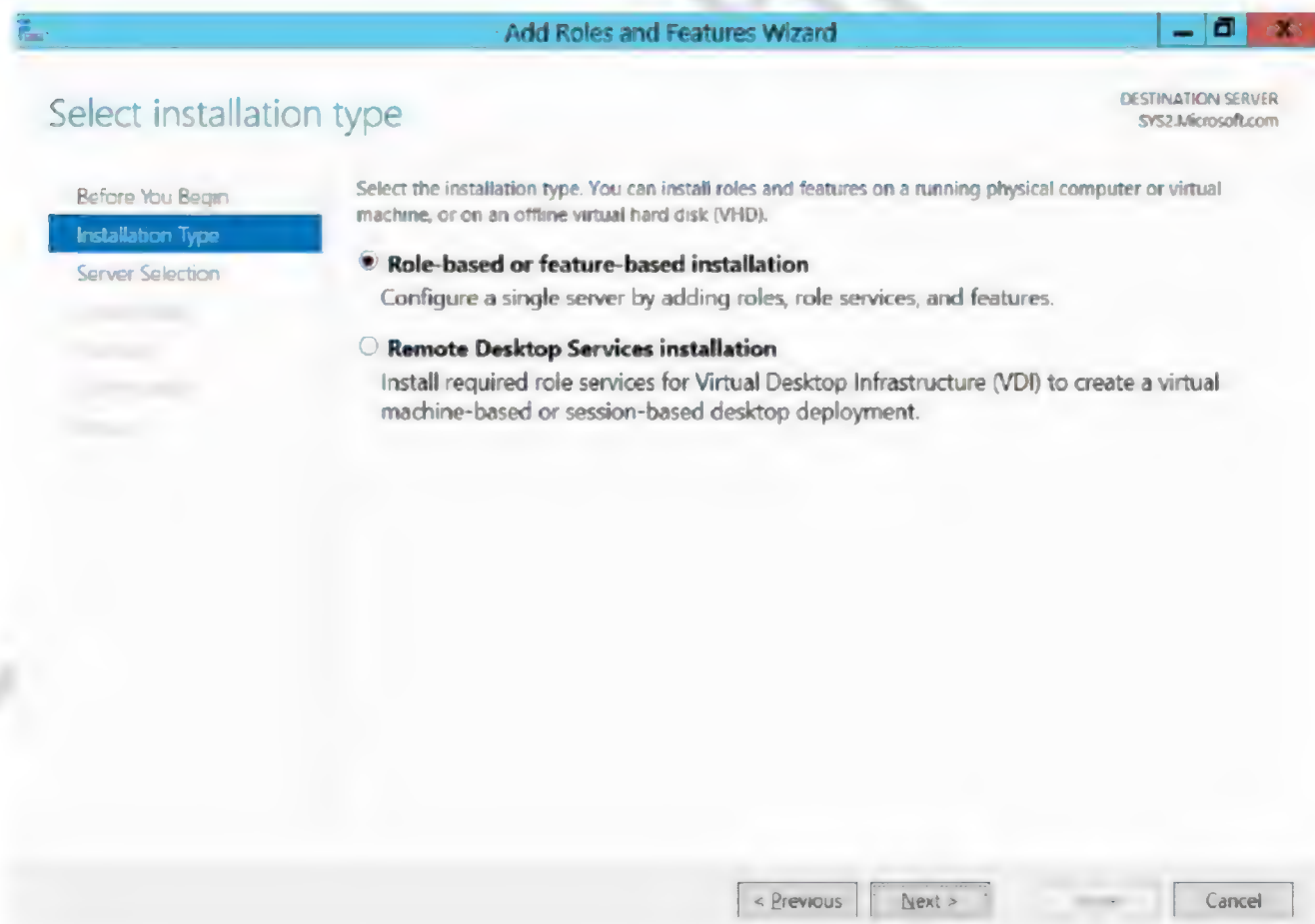
2. Select **Add roles and features.**



3. In Before you begin page, click **Next**.

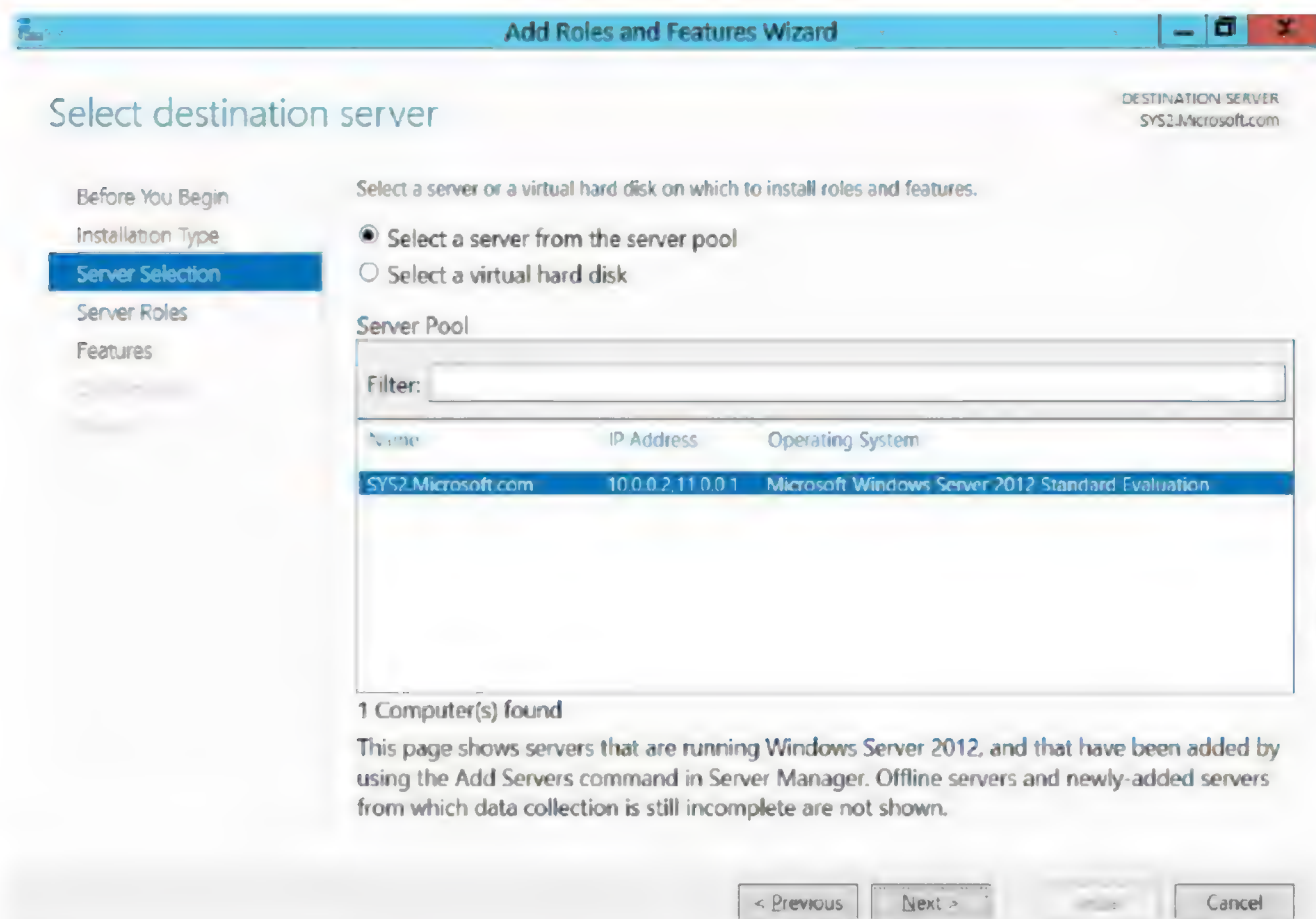


4. Select **Role-based or feature-based installation** → click **Next**

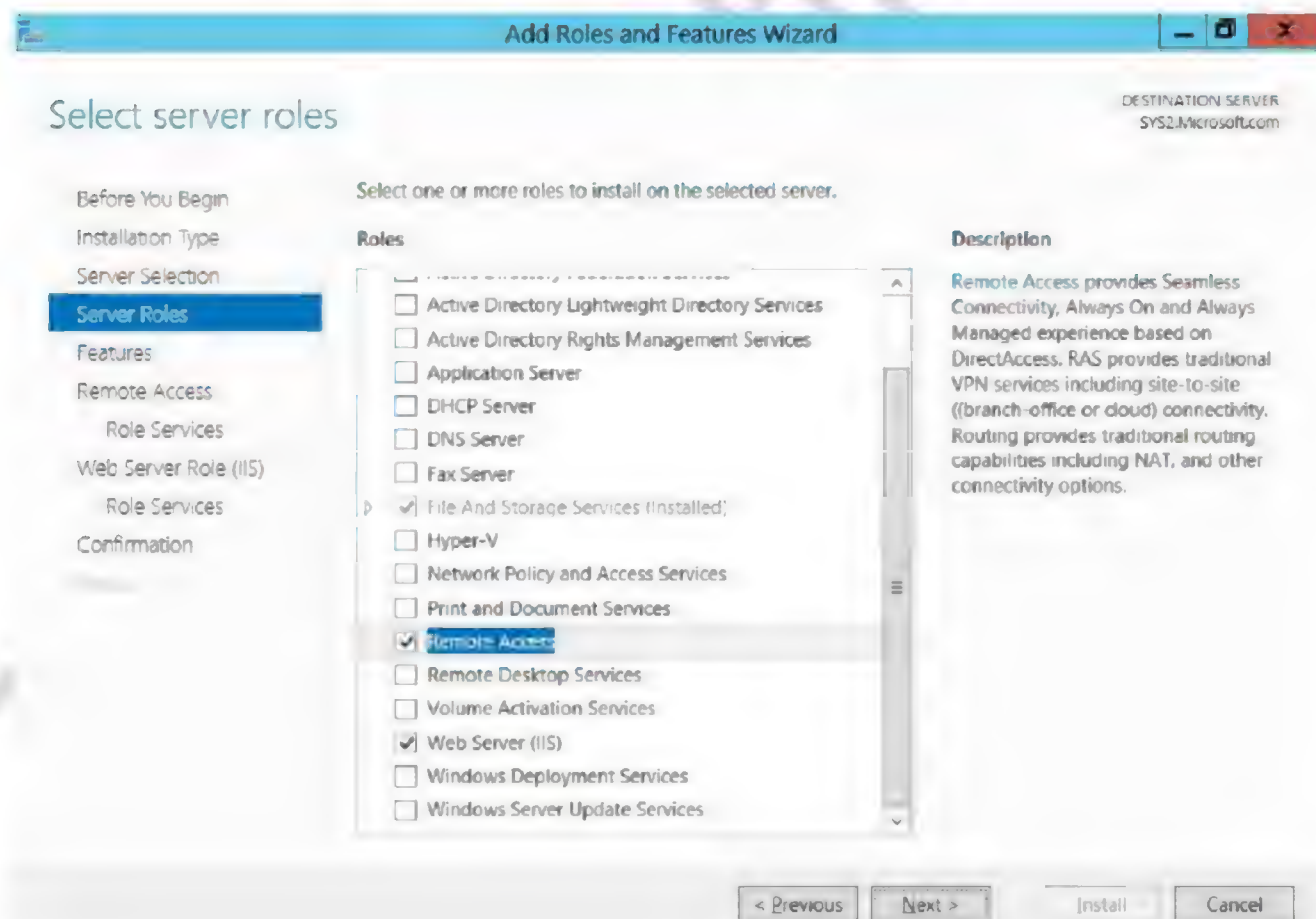




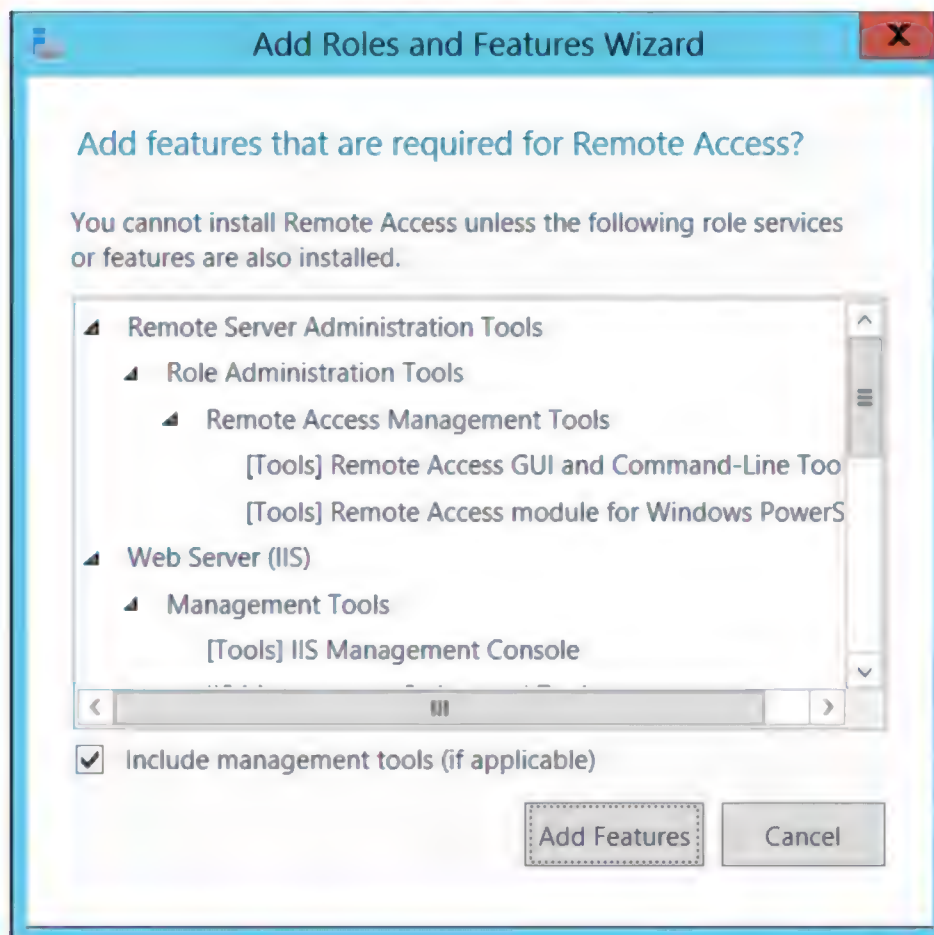
5. Select a server (**SYS2.Microsoft.com**) from the server pool and click **Next**.



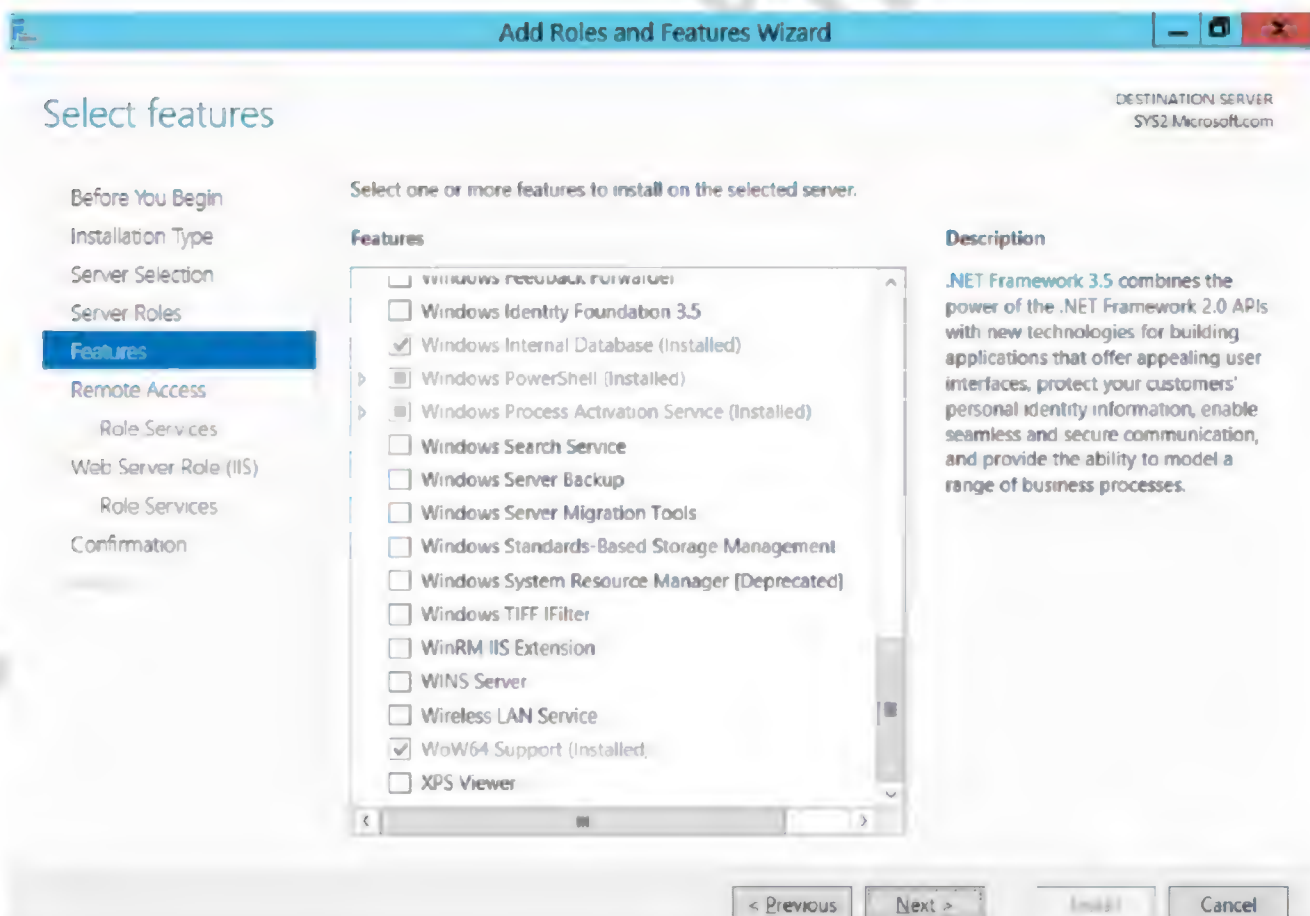
6. In select server roles, check the box **Remote Access**.



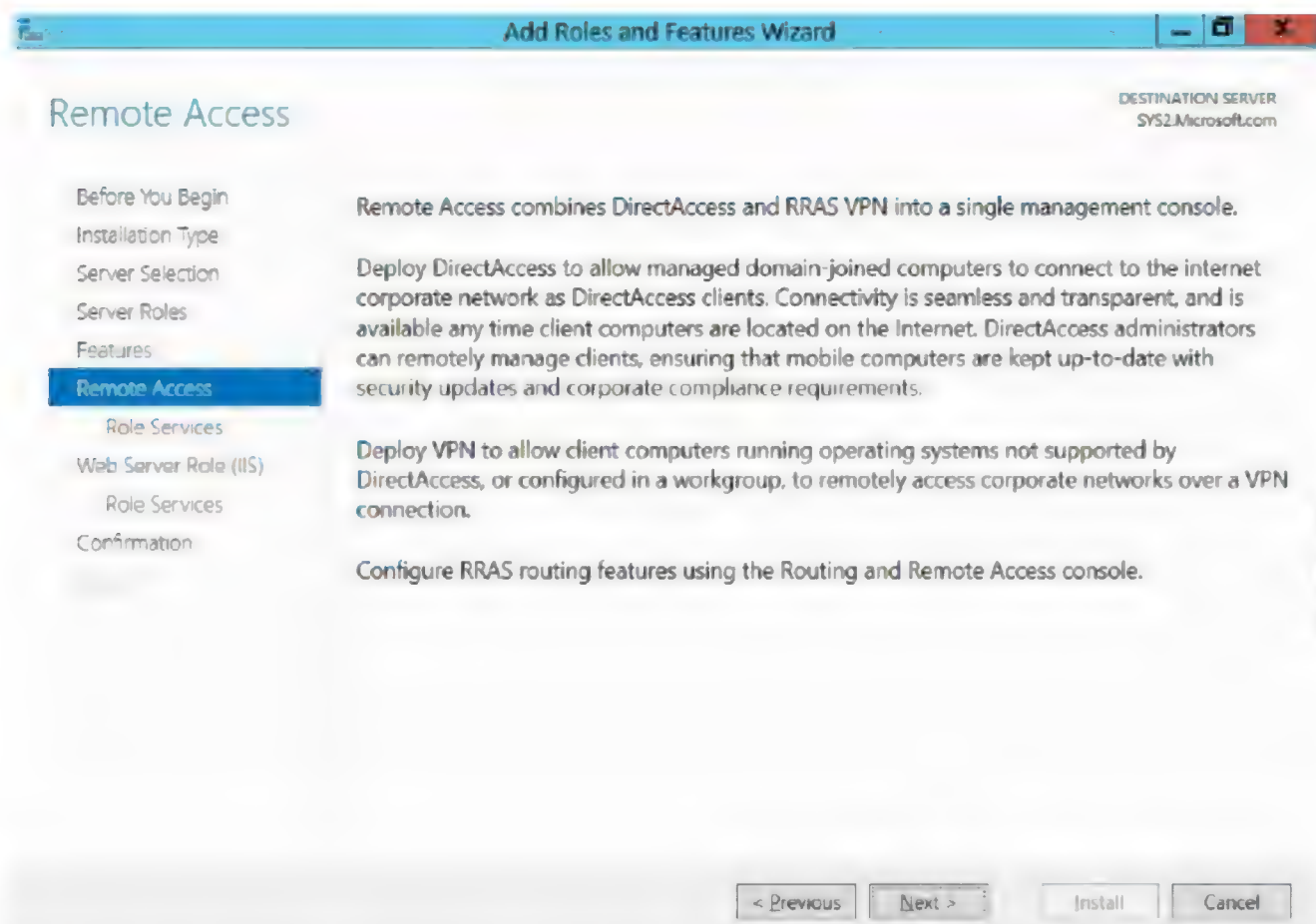
7. Click **Add Features**, to install the required features for Remote Access. Click **Next**.



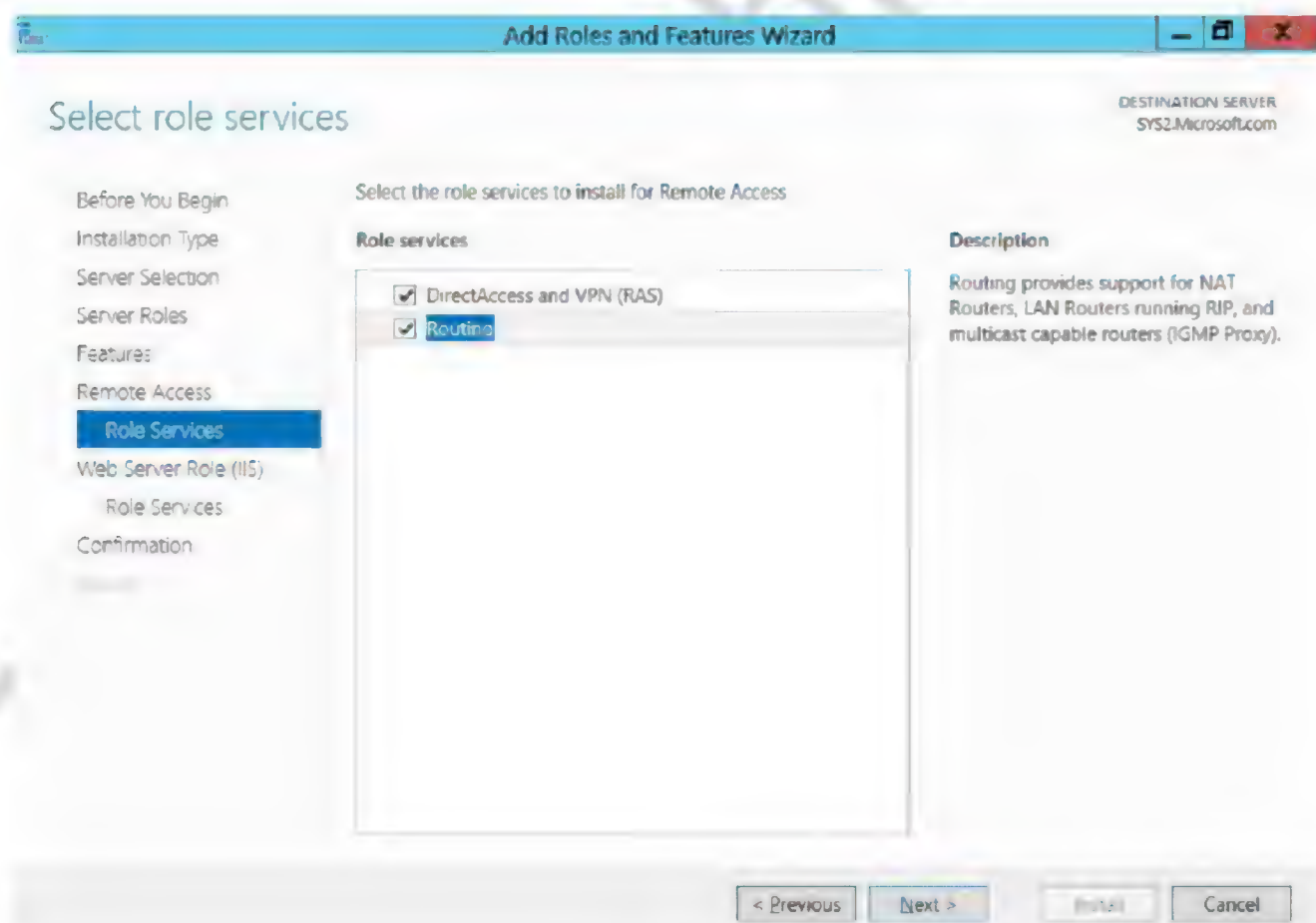
8. In Select features wizard, click **Next**.



9. In Remote Access Page, click **Next**.

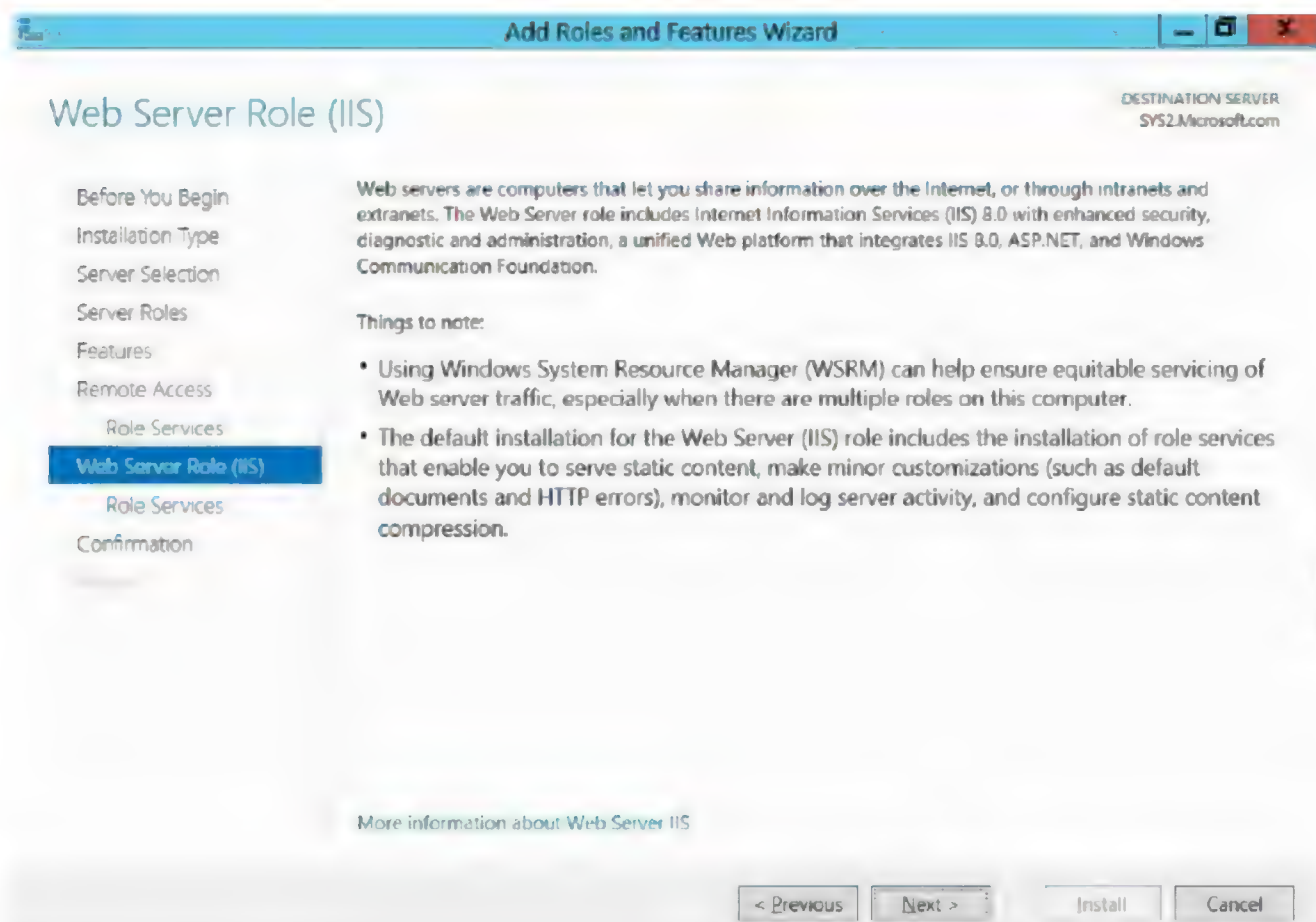


10. Check the box **Routing**, click **Next**.

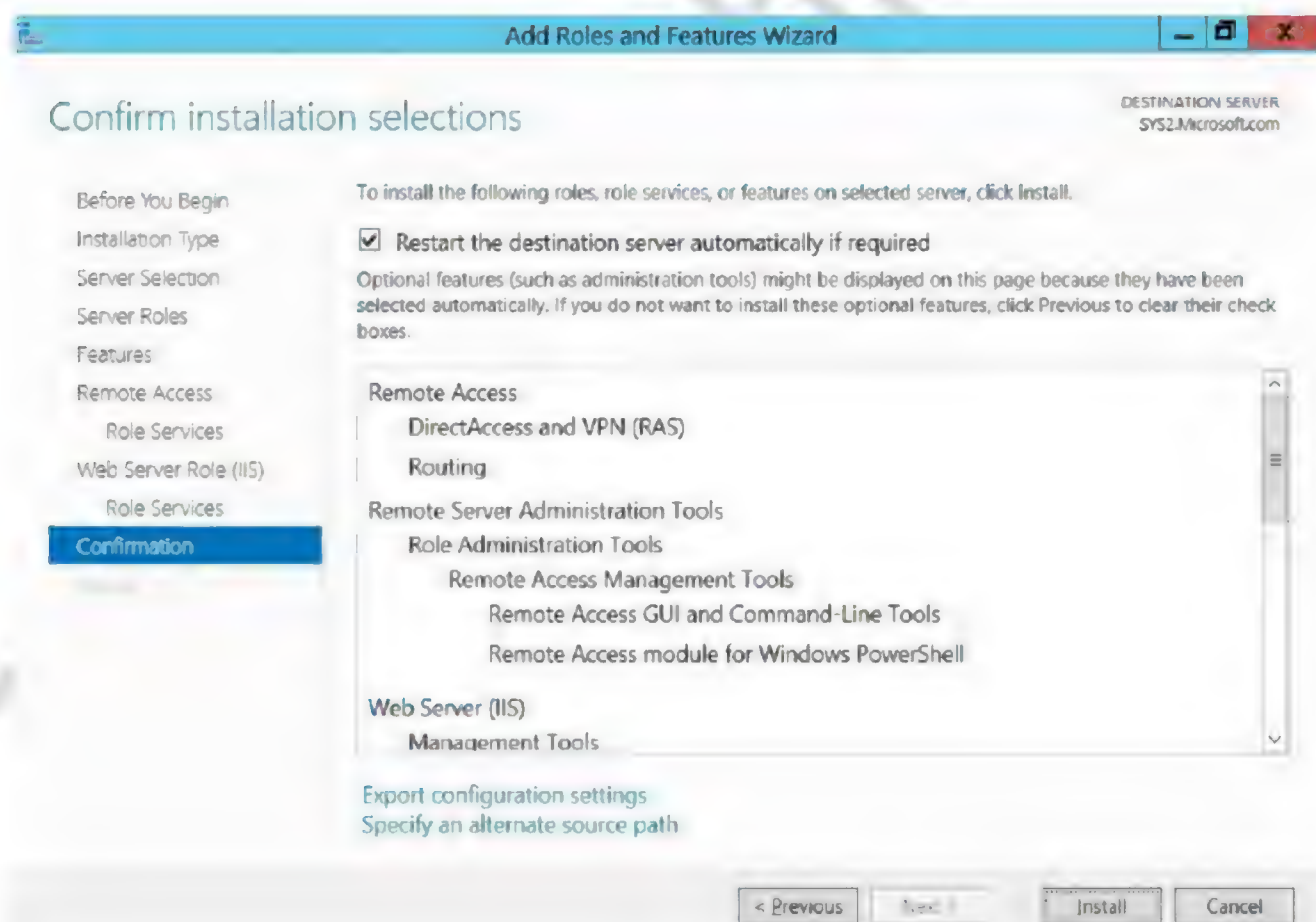




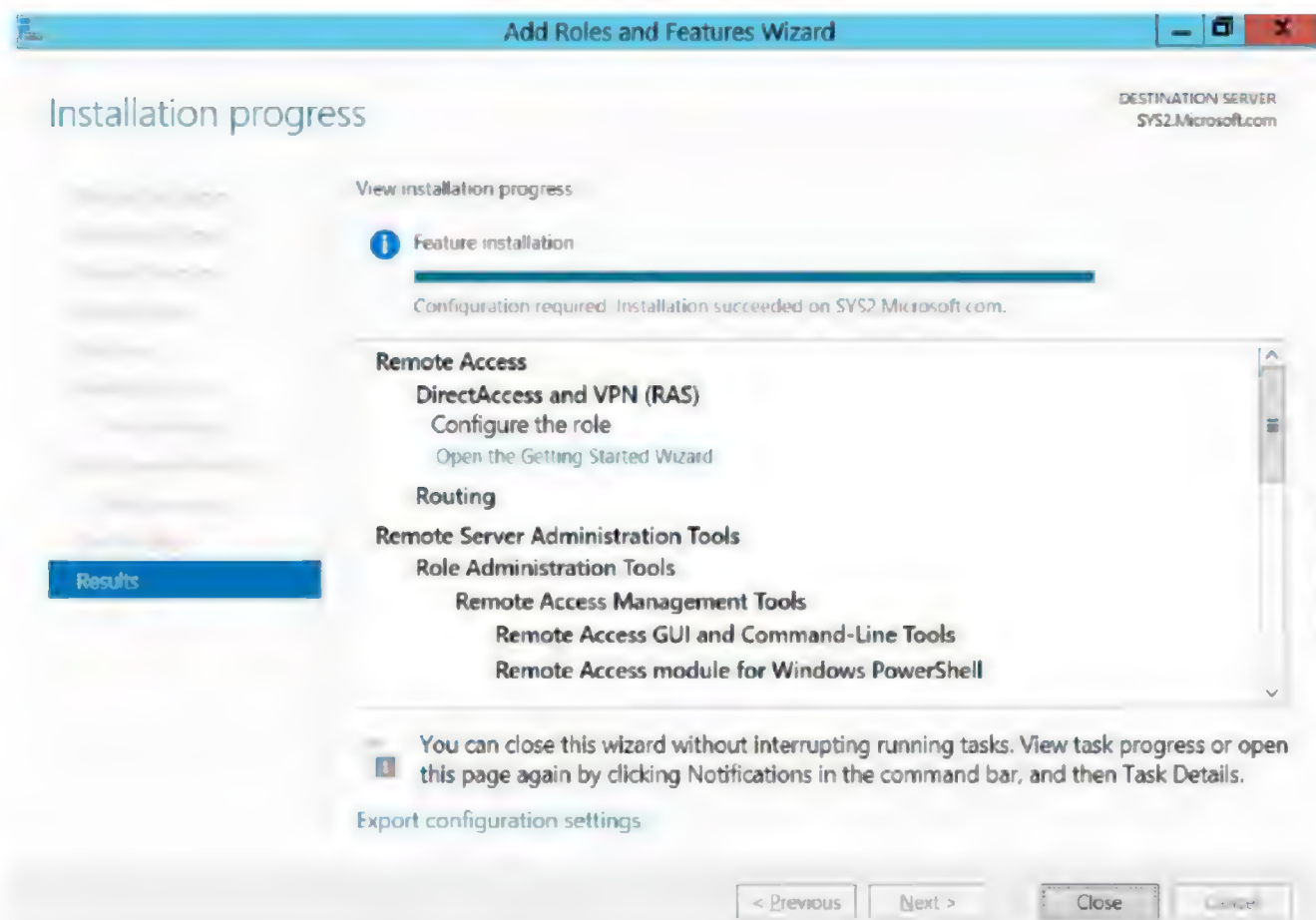
11. In Web Server Role (IIS) Page, click **Next**.



12. Check the box **Restart the destination server automatically if required**. Click **Install**.



13. Click **Close**.

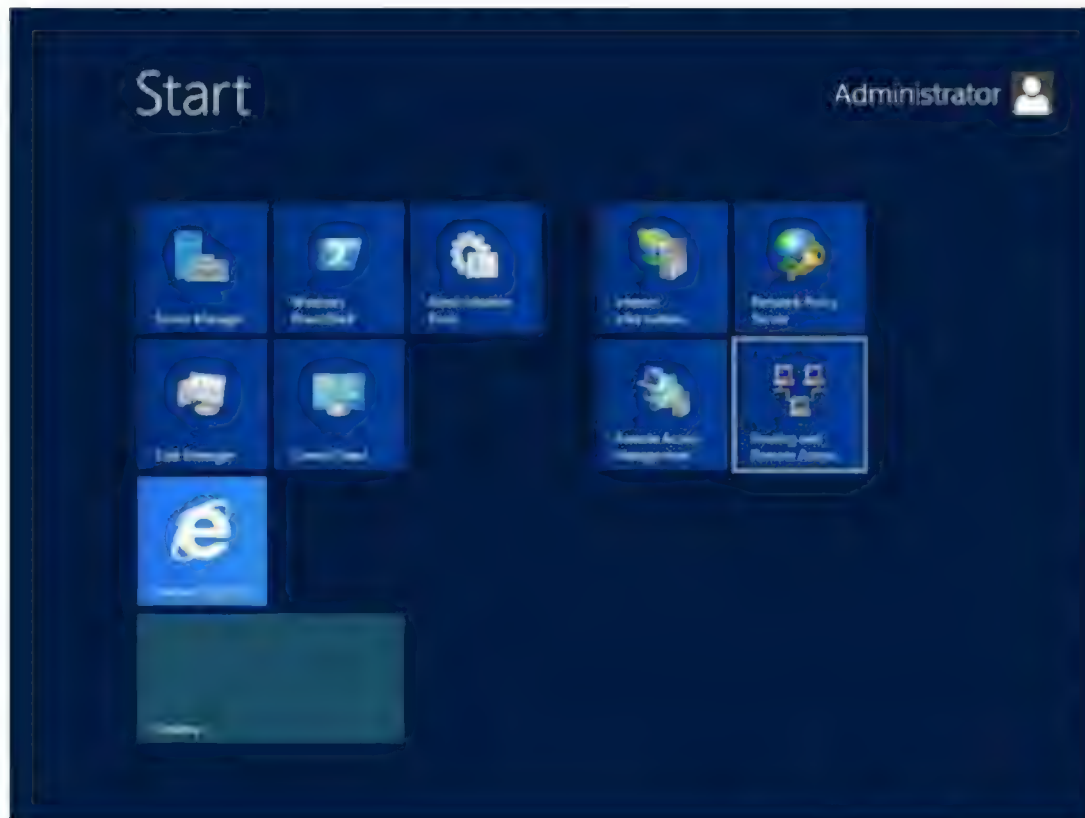


**Note:** Repeat the process of LAB2 on Router-2 (SYS3) also.

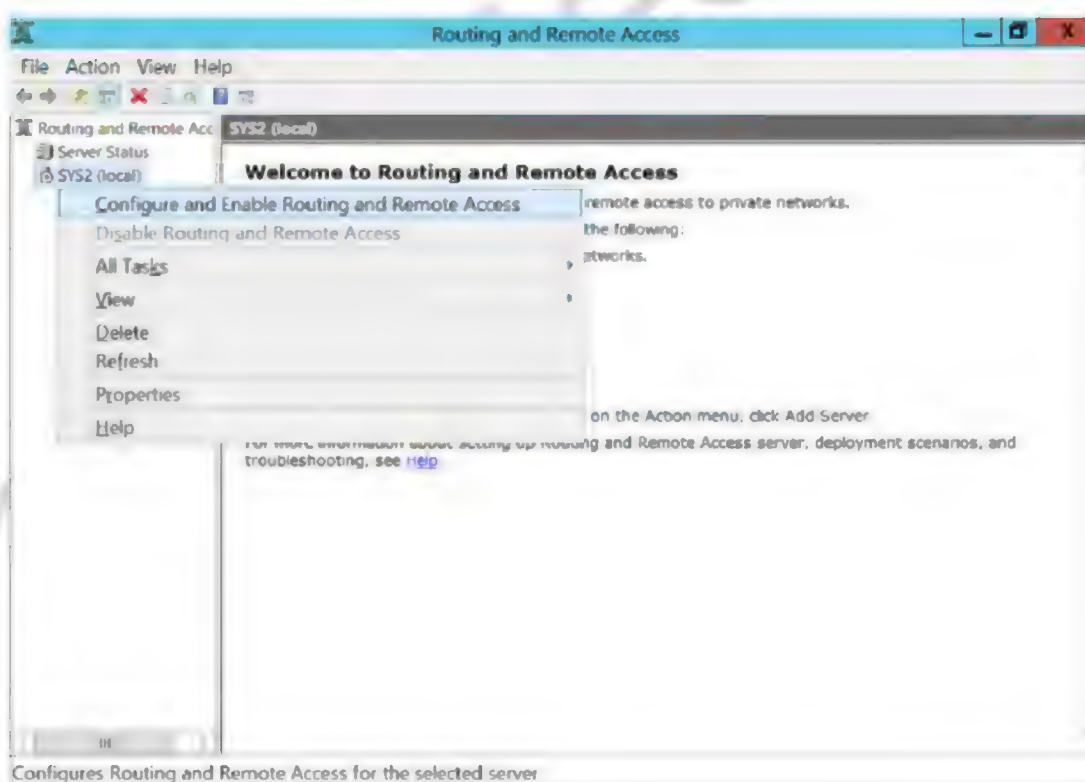
## Enabling Routing on Router1 & Router2

### SYS2 – CONFIGURATION

1. Go to Start, select **Routing and Remote Access**.

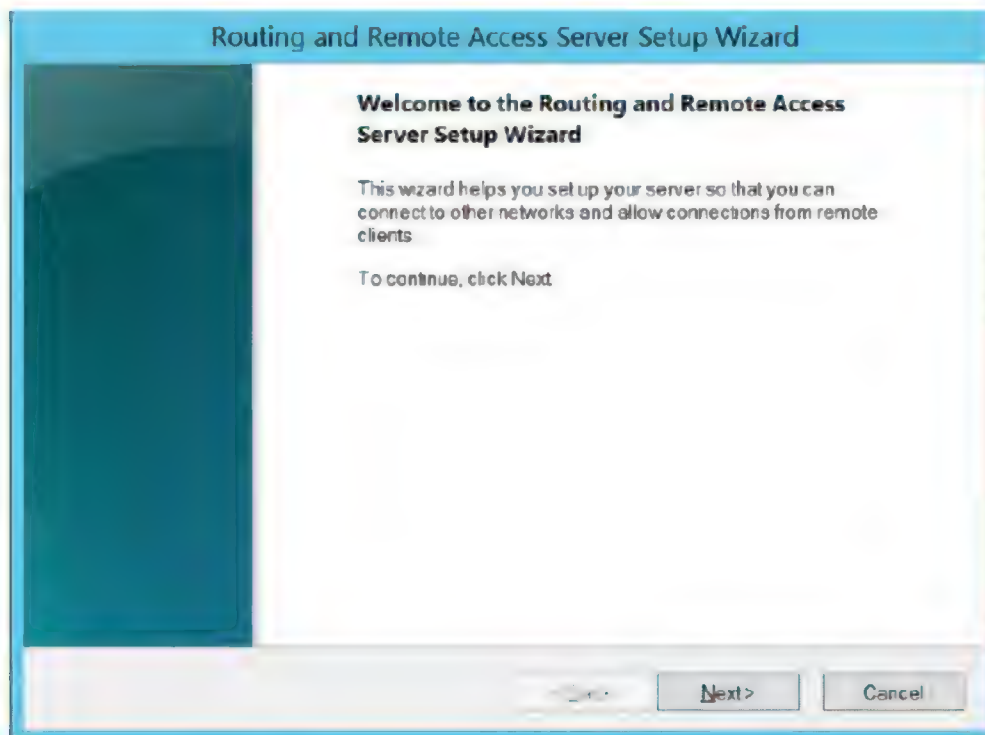


2. Right click on system name **Configure and Enable Routing and Remote Access**.

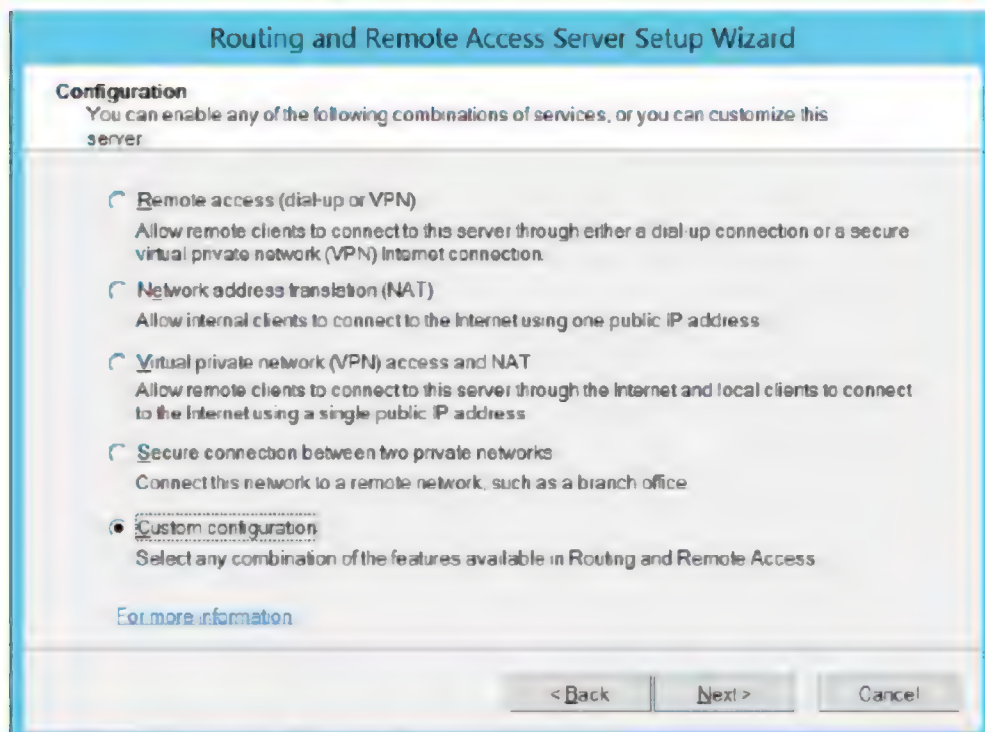




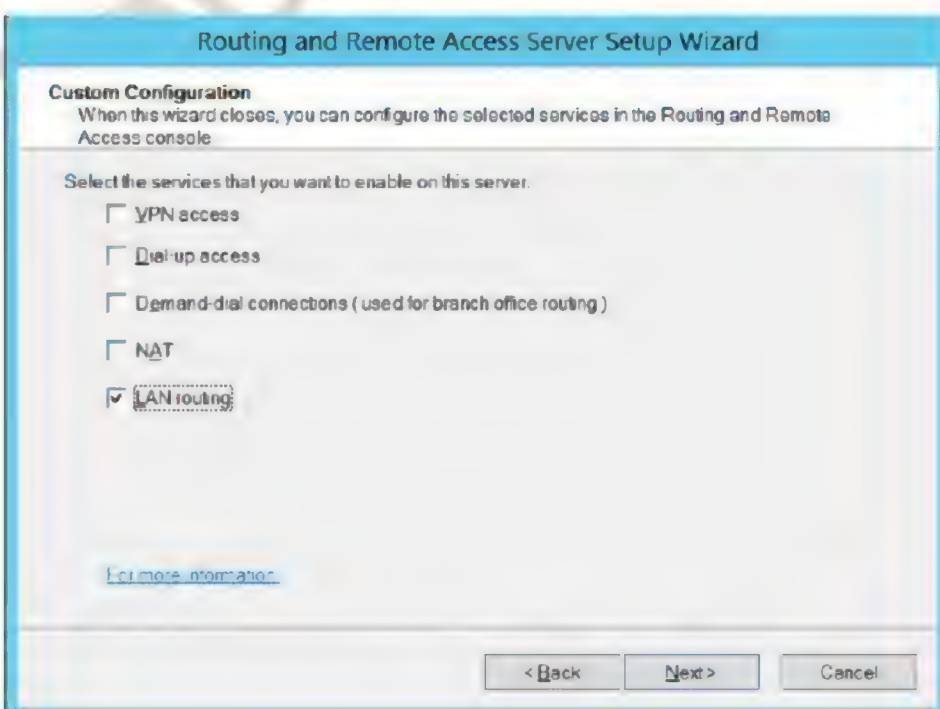
3. Click **Next**



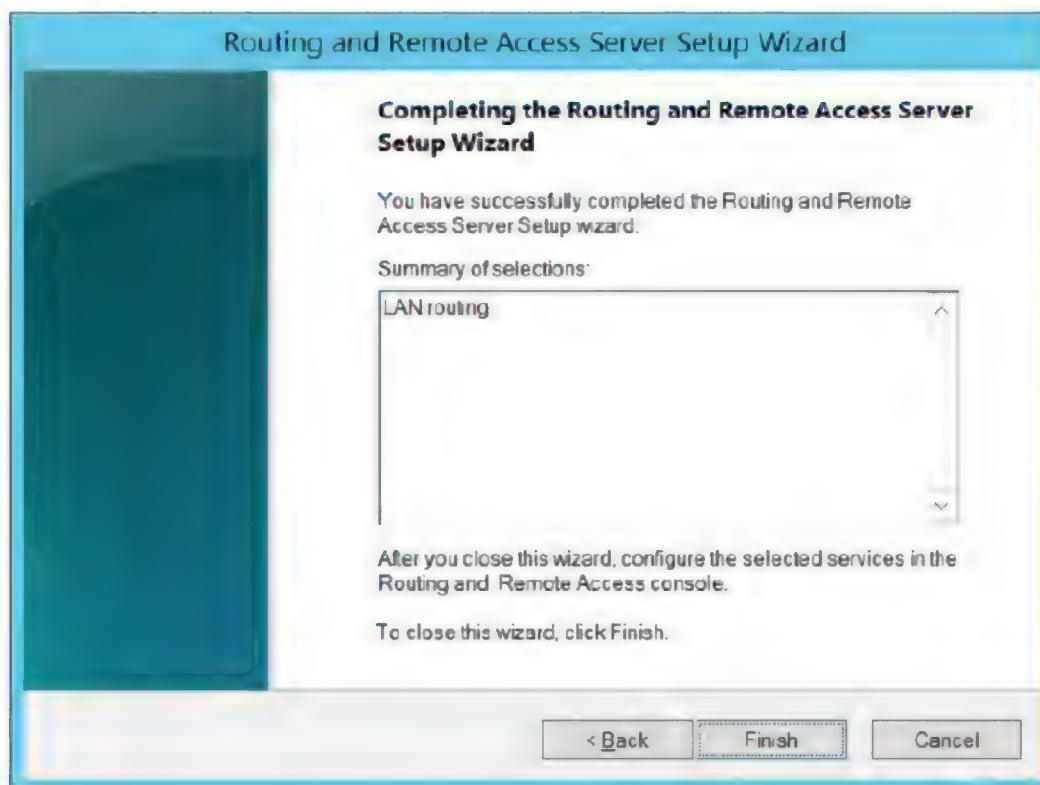
4. Select **Custom configuration** → click **Next**.



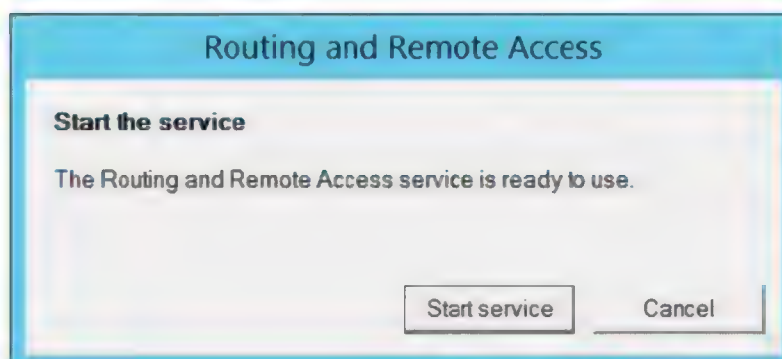
5. Select **LAN routing** → **Next**



6. Click **Finish**



7. Click **Start service**



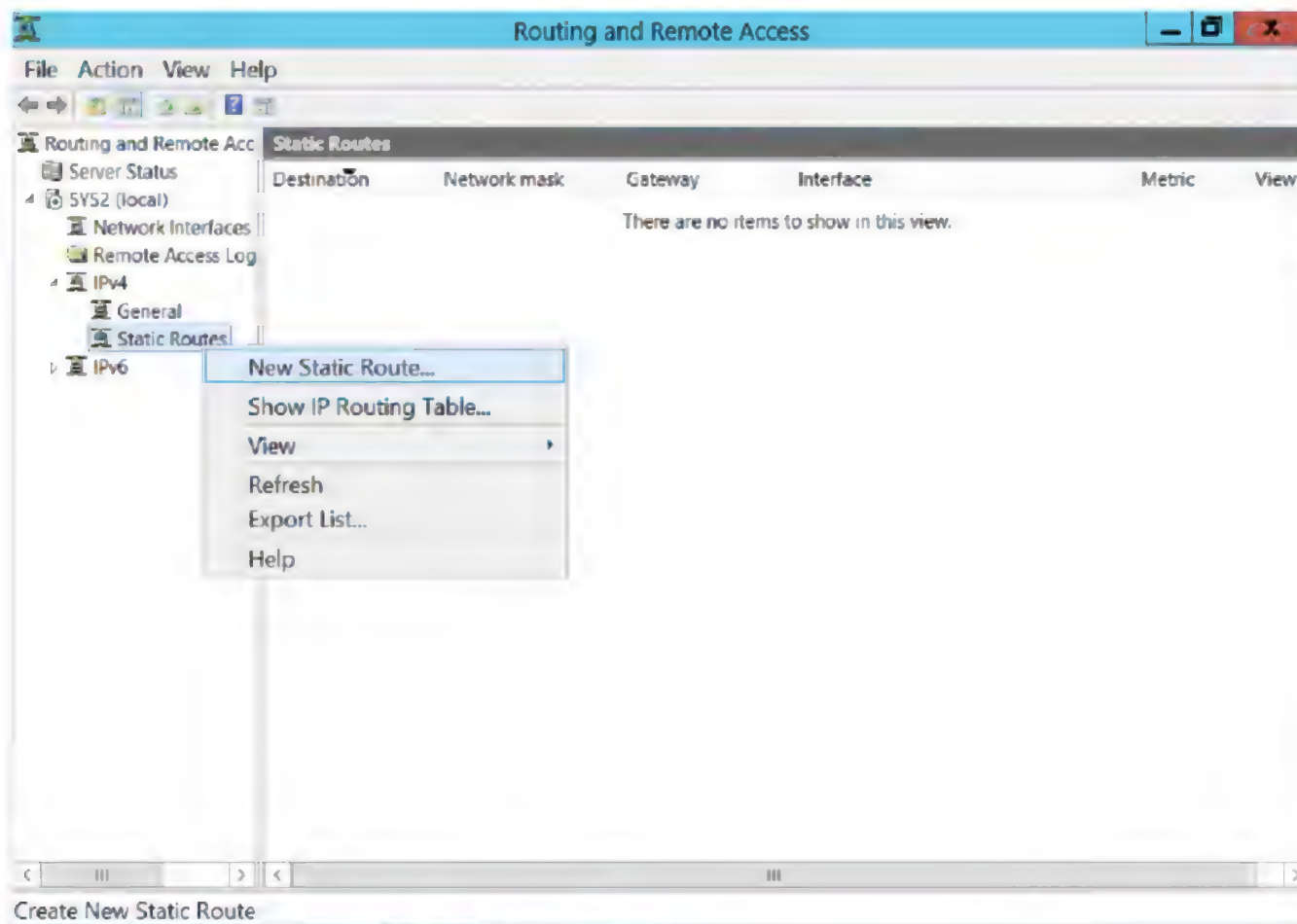
**Note:** Repeat the process of LAB3 on Router-2 (SYS3) also.

## Configuring Static Routes

### SYS2 – CONFIGURATION

#### ON ROUTER 1:

1. Go to Routing and Remote access → Expand System name → Expand **IPv4** → Select **Static Routes** → Right click and select **New Static Route**



2. Define the static route as mentioned below → click **OK**.

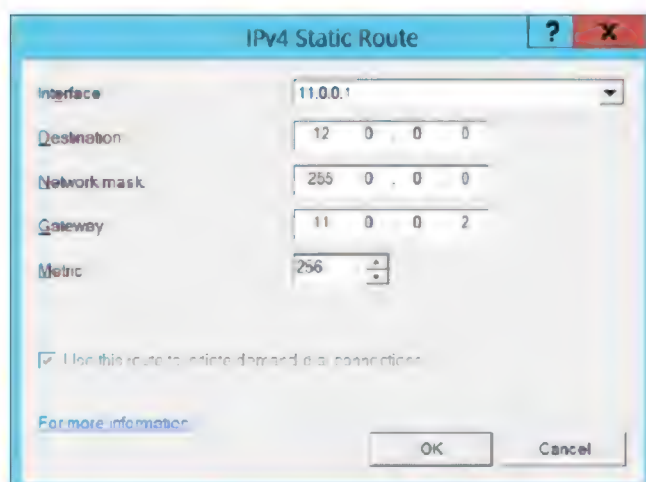
Interface      11.0.0.1

Destination    12.0.0.0

Network Mask   255.0.0.0

Gateway        11.0.0.2

Metric          256

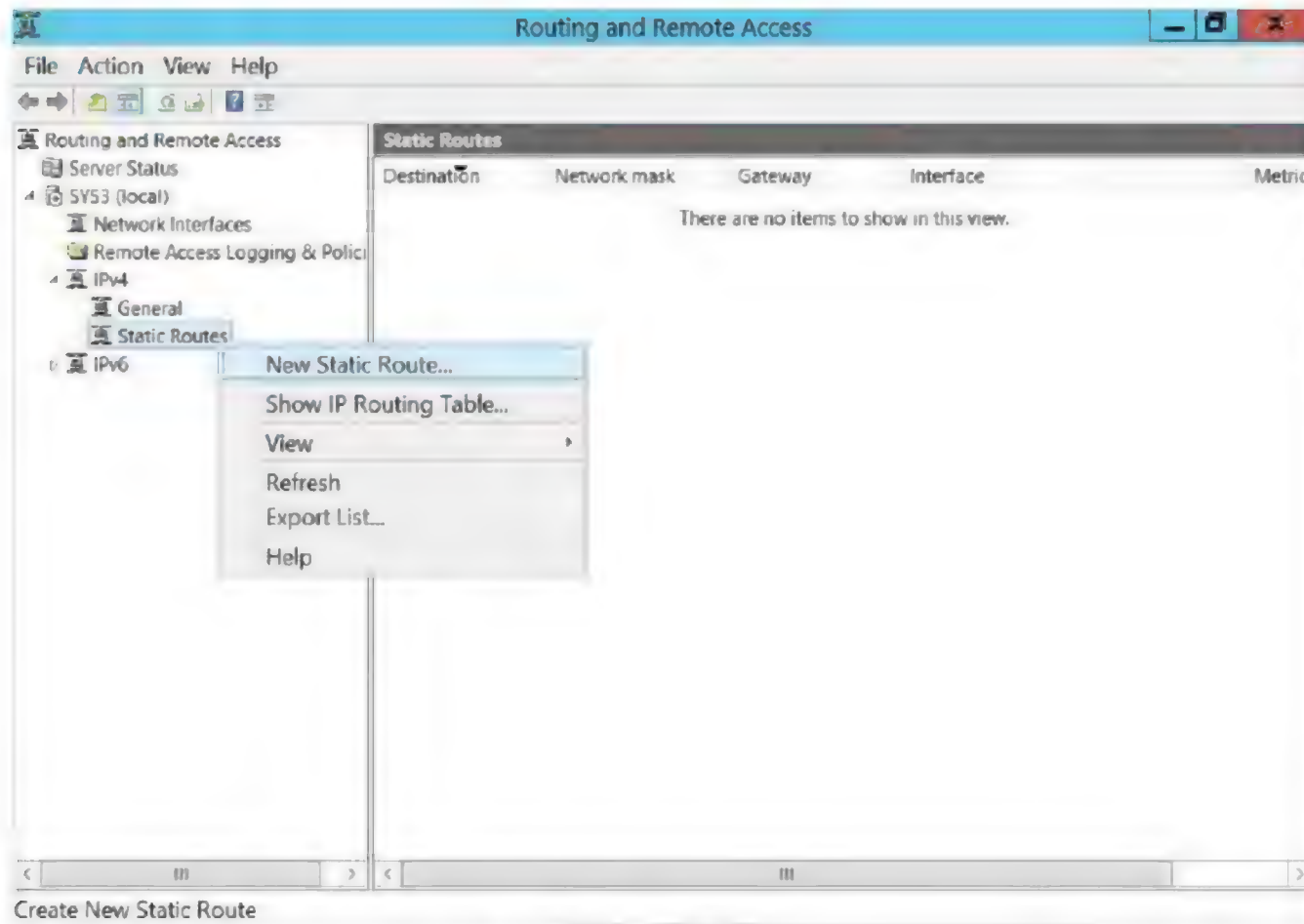




## SYS3 – CONFIGURATION

### ON ROUTER 2:

1. Go to Routing and Remote access → Expand System name → Expand **IPv4** → Select **Static Routes** → Right click and select **New Static Route**



2. Define the static route as mentioned below → click **OK**.

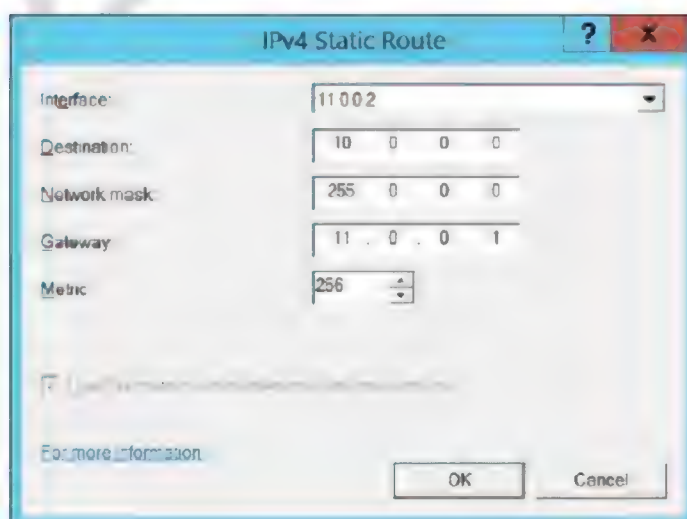
Interface      11.0.0.2

Destination    10.0.0.0

Network Mask   255.0.0.0

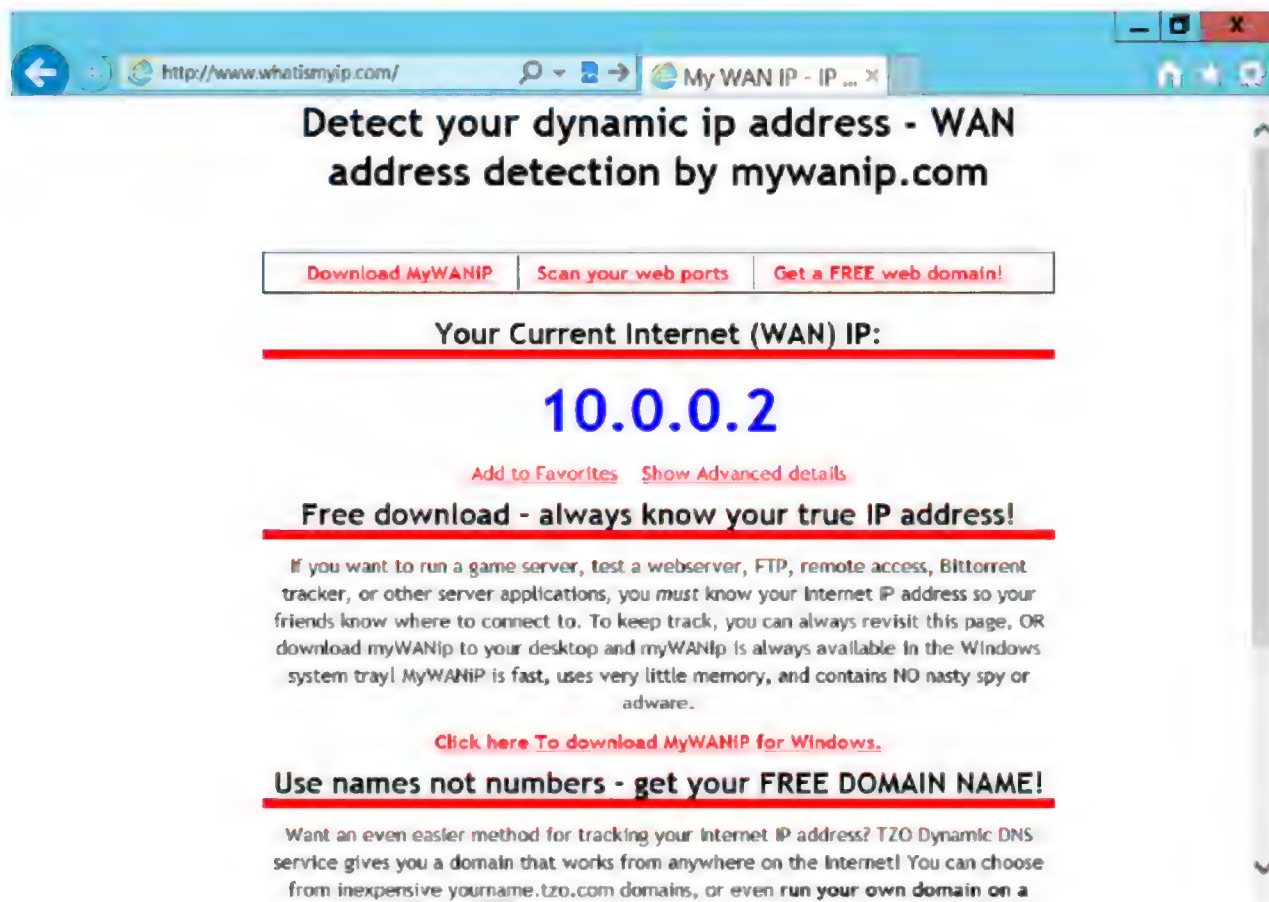
Gateway        11.0.0.1

Metric          256



**Verification:**

1. Check the connectivity between 10.0.0.0 and 12.0.0.0 Networks.
2. Log on to **SYS4**(12.0.0.2)→open command prompt, **Ping 10.0.0.2 -t** and verify for reply
3. Log on to **SYS1** (10.0.0.2)→Open the Internet Explorer and access the website <http://www.whatismyip.com> (Website is present on 12.0.0.2), to verify the communication between both networks.



## Lab – 72: Configuring Network Address Translation

### Objective:

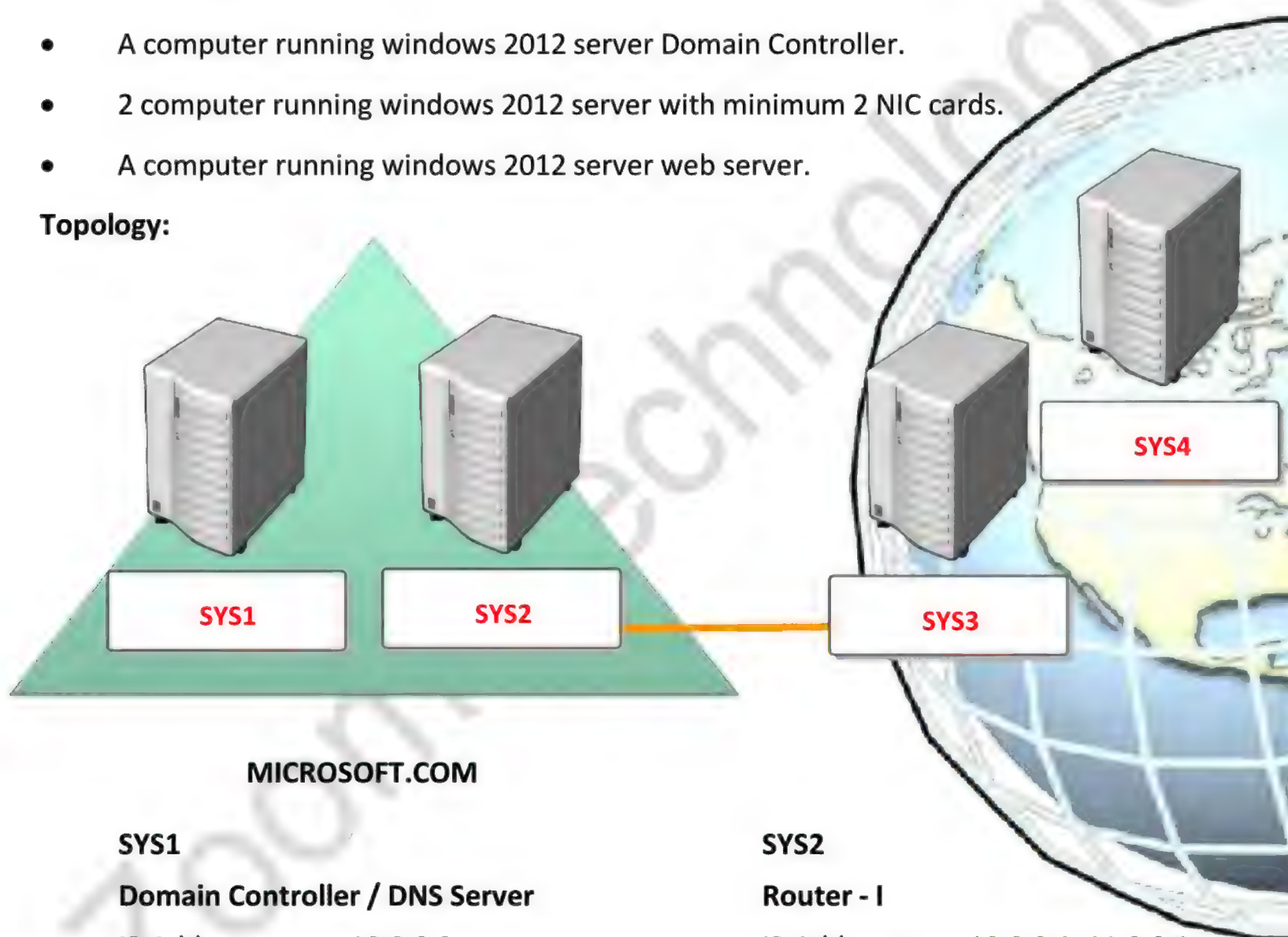
To configure NAT to translate private IP addresses to public IP addresses and vice versa

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- 2 computer running windows 2012 server with minimum 2 NIC cards.
- A computer running windows 2012 server web server.

### Topology:



#### SYS1

##### Domain Controller / DNS Server

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Gateway	10.0.0.1
DNS Server	10.0.0.2, 12.0.0.2

#### SYS3

##### Router – II

IP Address	11.0.0.2,12.0.0.1
Subnet Mask	255.0.0.0
Gateway	-----
DNS Server	12.0.0.2

#### SYS2

##### Router - I

IP Address	10.0.0.1, 11.0.0.1
Subnet Mask	255.0.0.0
Gateway	-----
DNS Server	10.0.0.2

#### SYS4

##### Web server / DNS Server

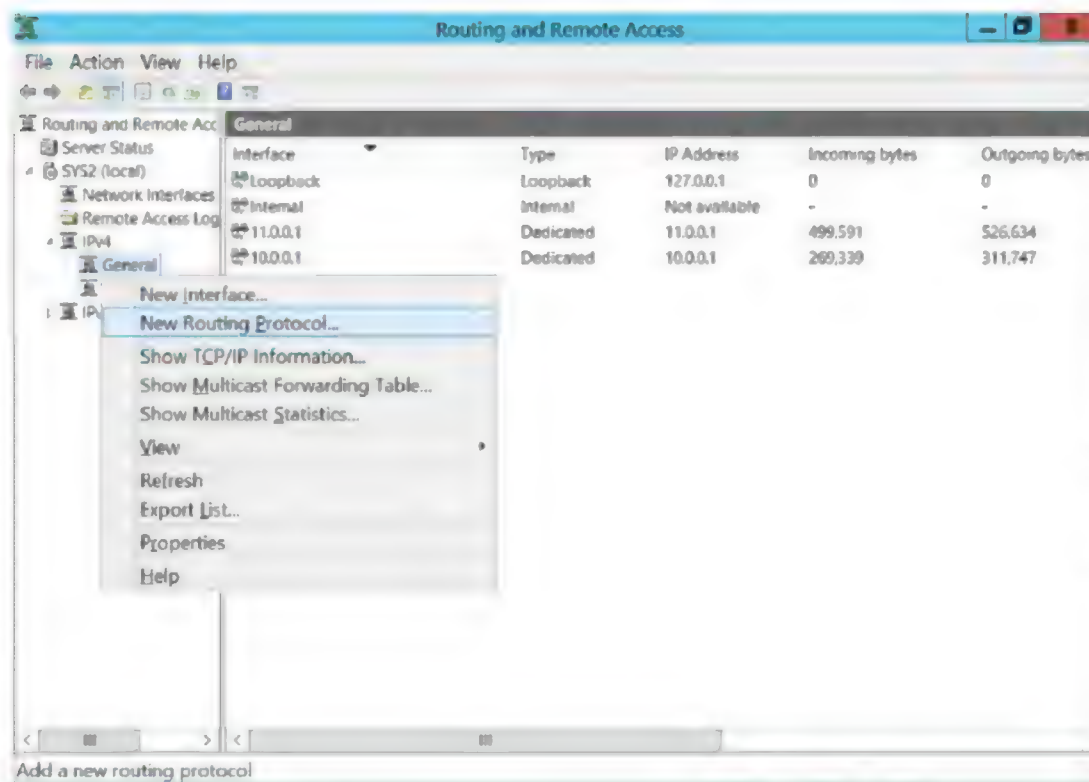
IP Address	12.0.0.2
Subnet Mask	255.0.0.0
Gateway	12.0.0.1
DNS Server	12.0.0.2, 12.0.0.1



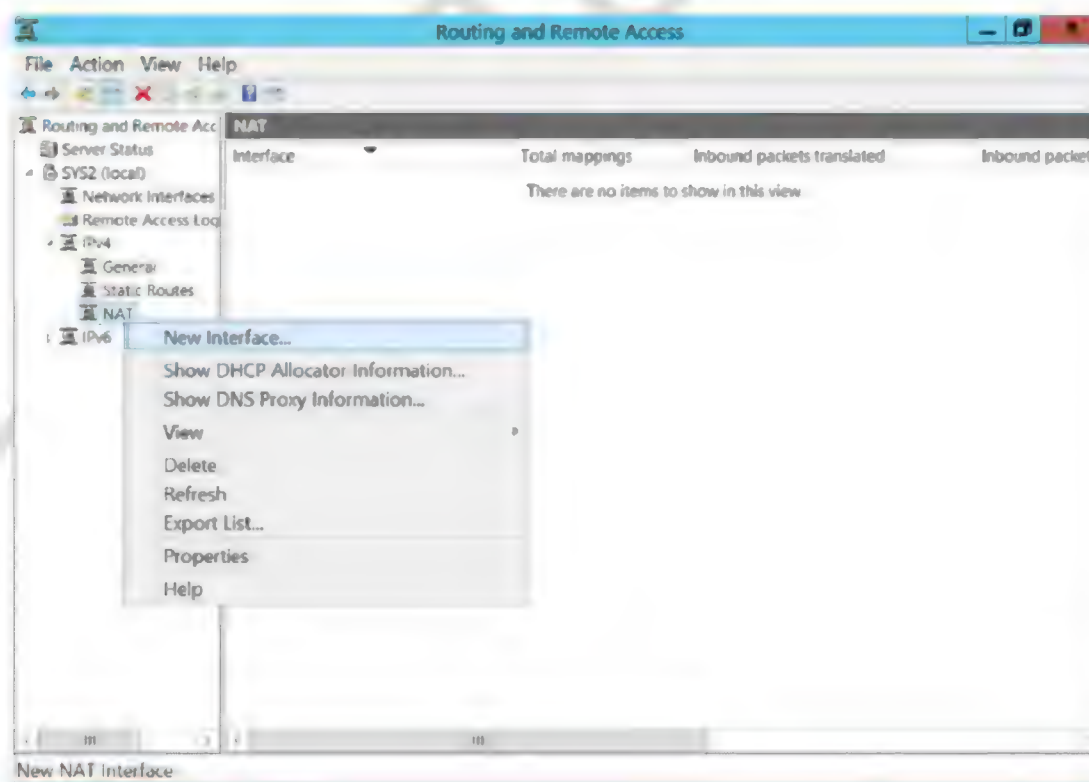
## SYS2 – CONFIGURATION

### On ROUTER1:

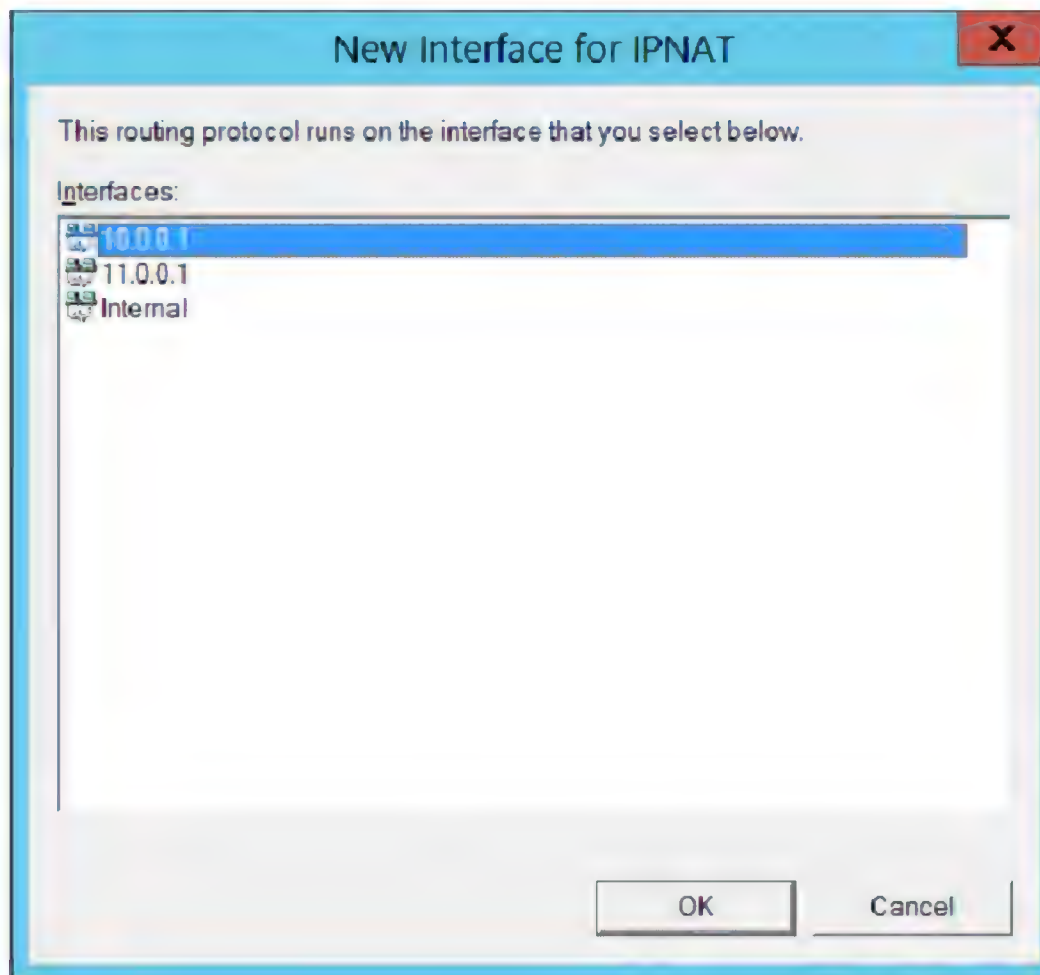
1. Go to Routing and Remote access → Expand System name → Expand IPv4
2. Right click on **General** → Select **New Routing Protocol**



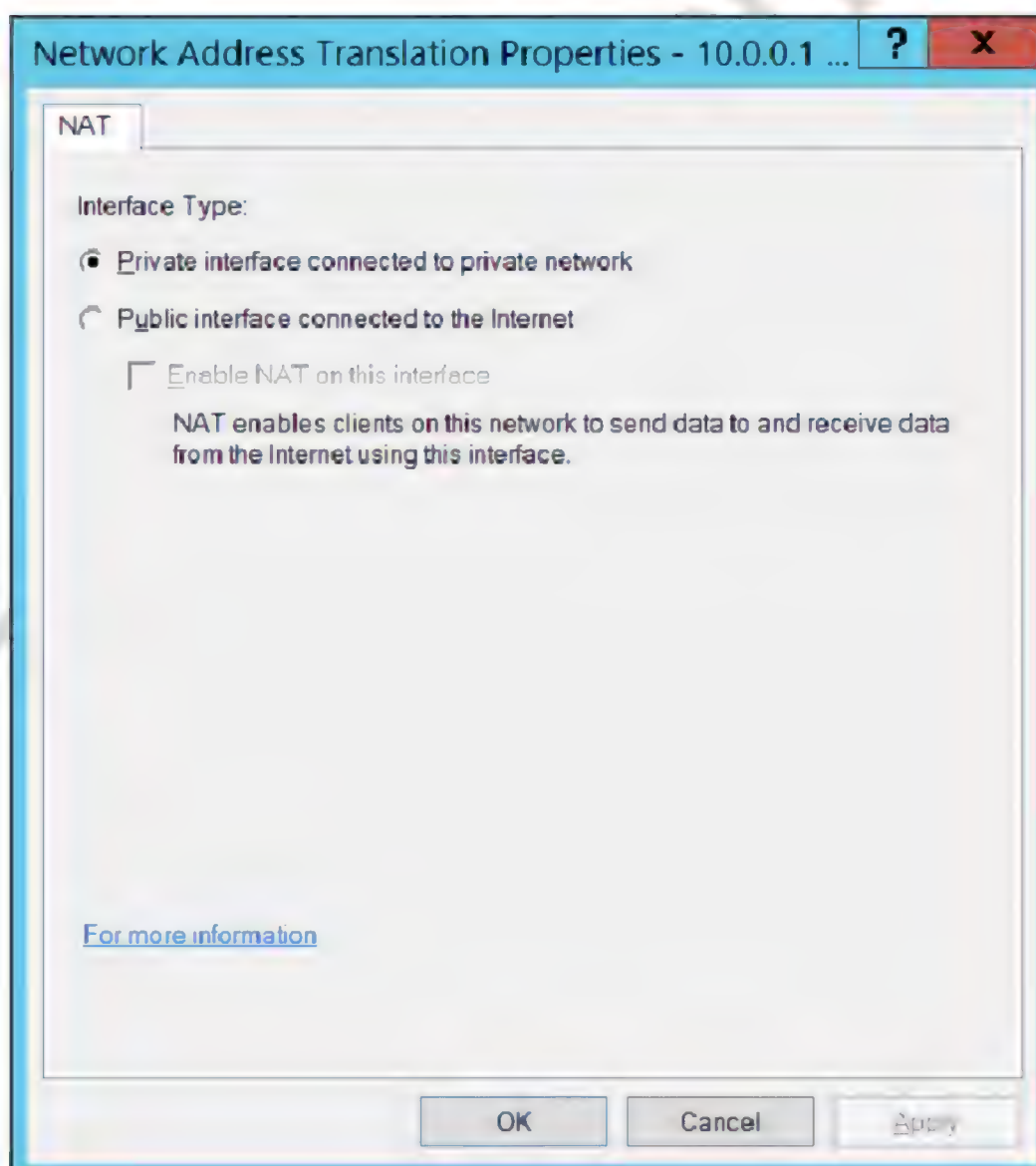
3. Select **NAT** → click **OK**
4. Right click on **NAT** → Select **New interface**



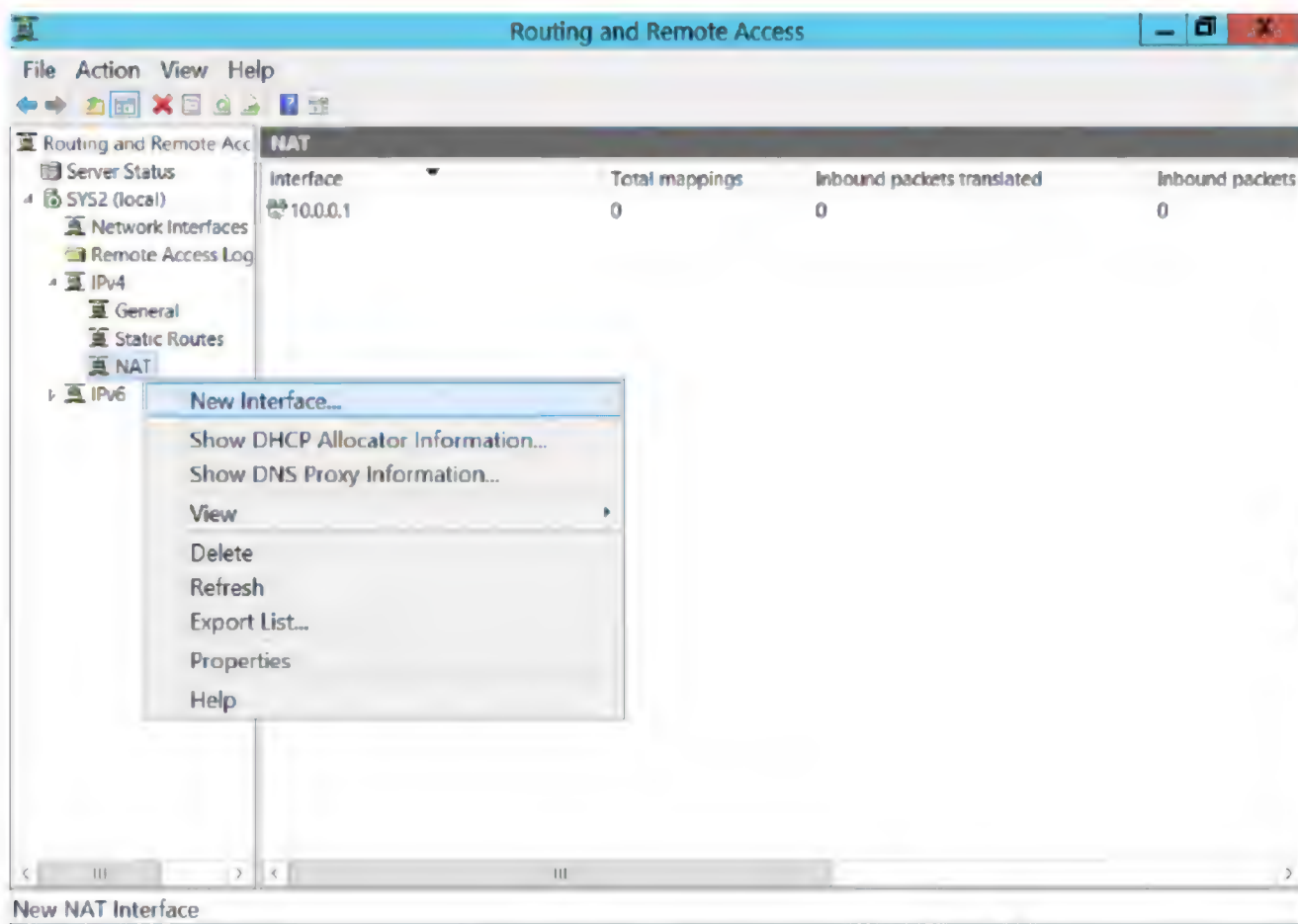
5. Select **LAN** interface → click **OK**



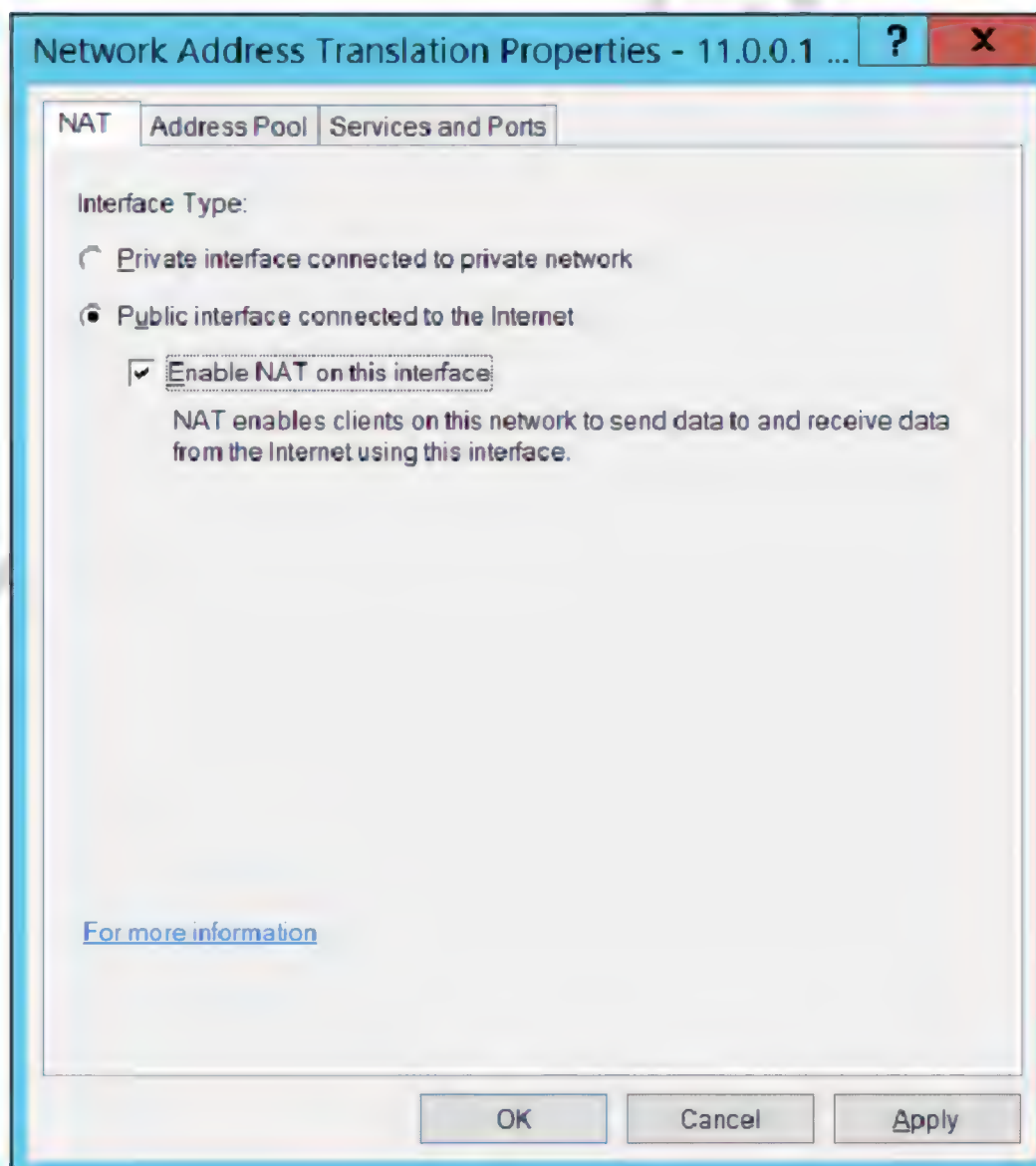
6. Select **Private Interface** → Click **OK**.



7. Again Right click on **NAT** → Select **New interface**



8. Select **WAN** Interface (11.0.0.1) → click **OK**
9. Select **Public interface**, Select **Enable NAT** → click **OK**.

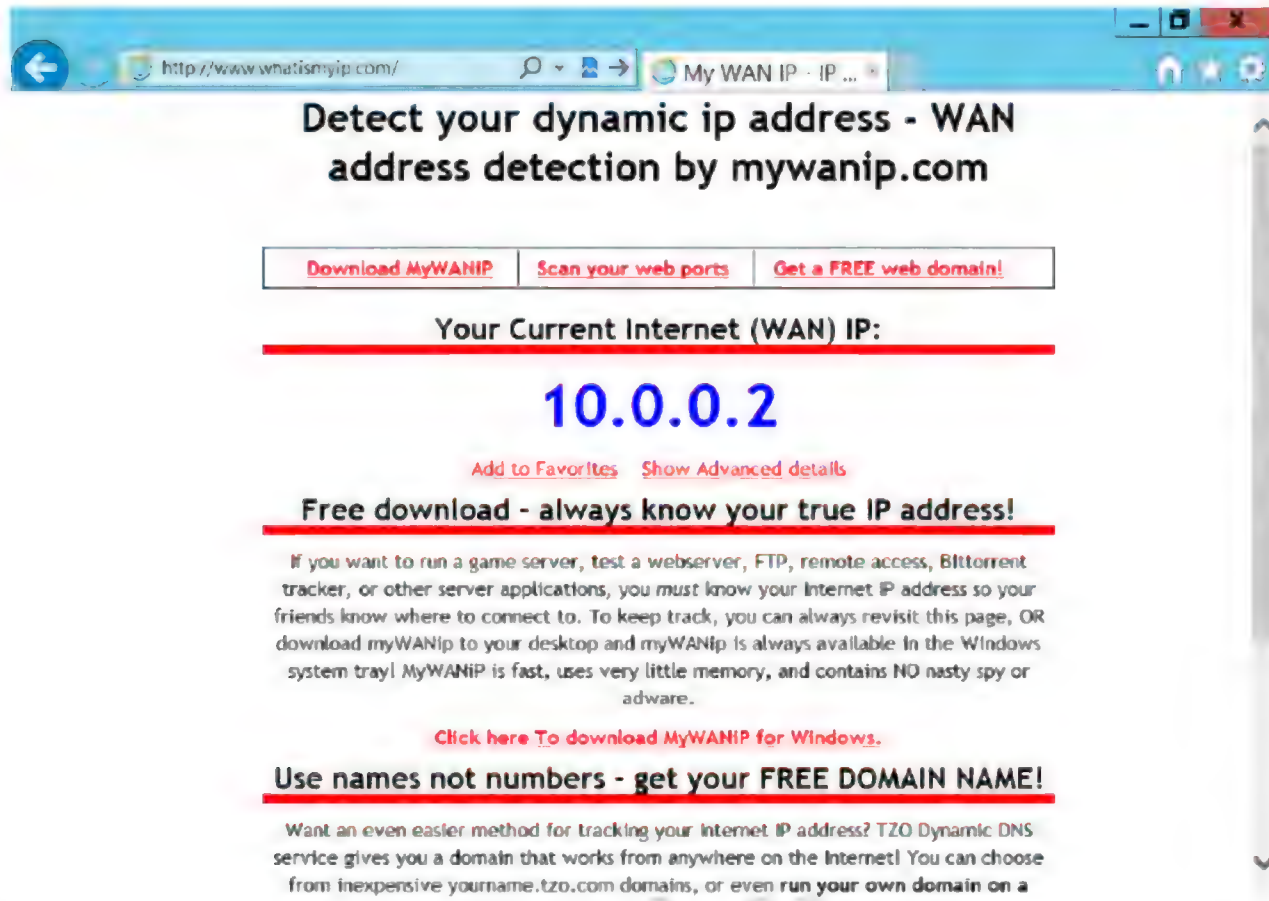




## Verification:

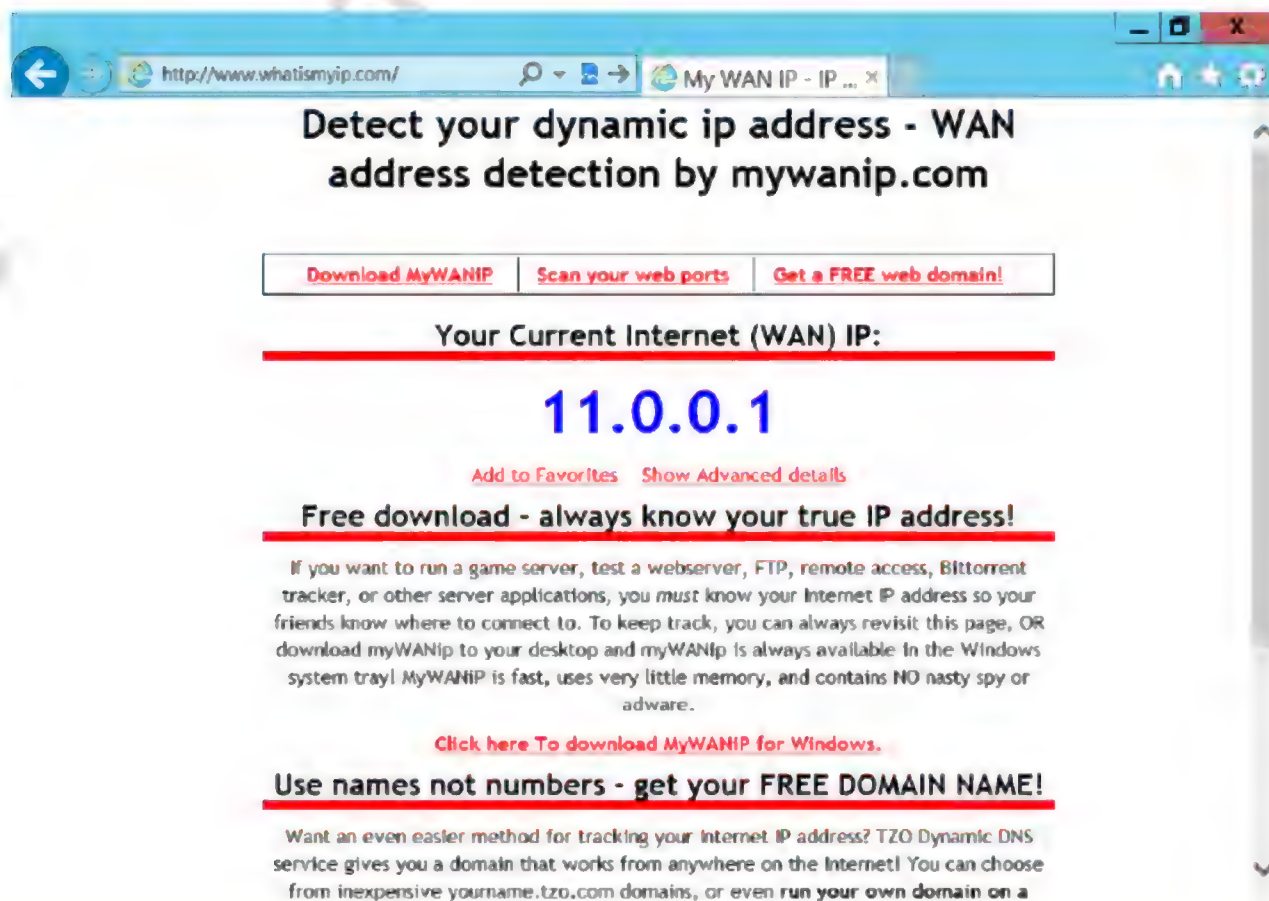
### Before NAT:

**On Private** → Open Internet Explorer & access <http://www.whatismyip.com> the IP address is shown as 10.0.0.2 Private IP.



### After NAT

**On Private** → Open Internet Explorer & access <http://www.whatismyip.com> the IP address is shown as 11.0.0.1 Public IP.



## Lab – 73: Configuring DHCP Relay Agent

### Objective:

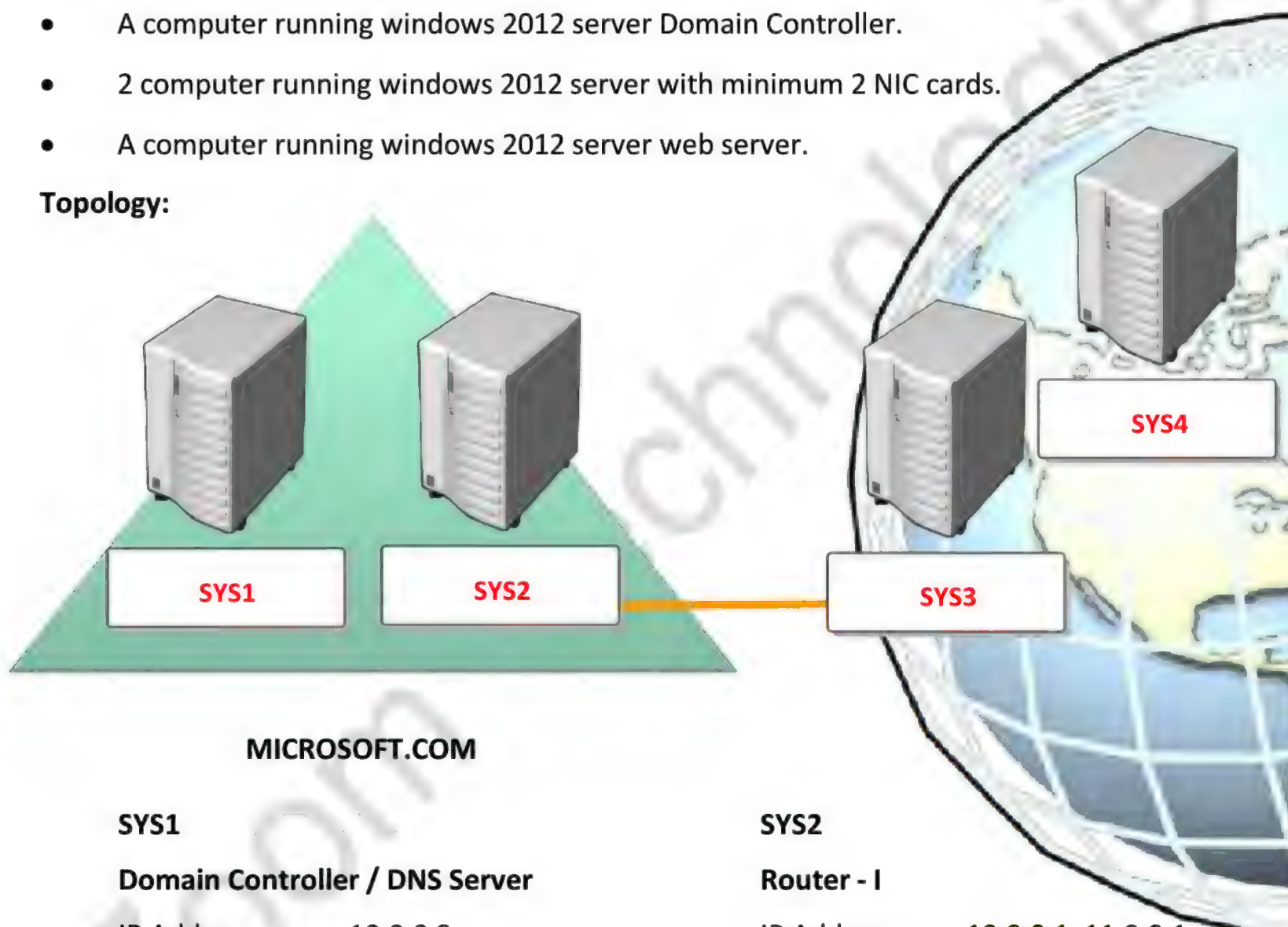
To assign IP addresses to clients in another network using a DHCP relay agent

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- 2 computer running windows 2012 server with minimum 2 NIC cards.
- A computer running windows 2012 server web server.

### Topology:



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#### SYS1

##### Domain Controller / DNS Server

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Gateway	10.0.0.1
DNS Server	10.0.0.2, 12.0.0.2

#### SYS3

##### Router – II

IP Address	11.0.0.2,12.0.0.1
Subnet Mask	255.0.0.0
Gateway	-----
DNS Server	12.0.0.2

#### SYS2

##### Router - I

IP Address	10.0.0.1, 11.0.0.1
Subnet Mask	255.0.0.0
Gateway	-----
DNS Server	10.0.0.2

#### SYS4

##### Web server / DNS Server

IP Address	12.0.0.2
Subnet Mask	255.0.0.0
Gateway	12.0.0.1
DNS Server	12.0.0.2, 12.0.0.1



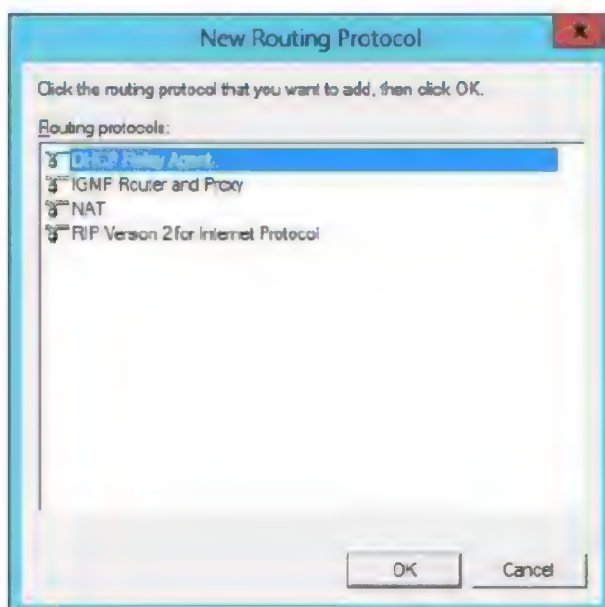
## SYS1-CONFIGURATION

**Note:** Install DHCP service and create a scope with 12.0.0.10 to 12.0.0.100 with the router IP as 12.0.0.1.

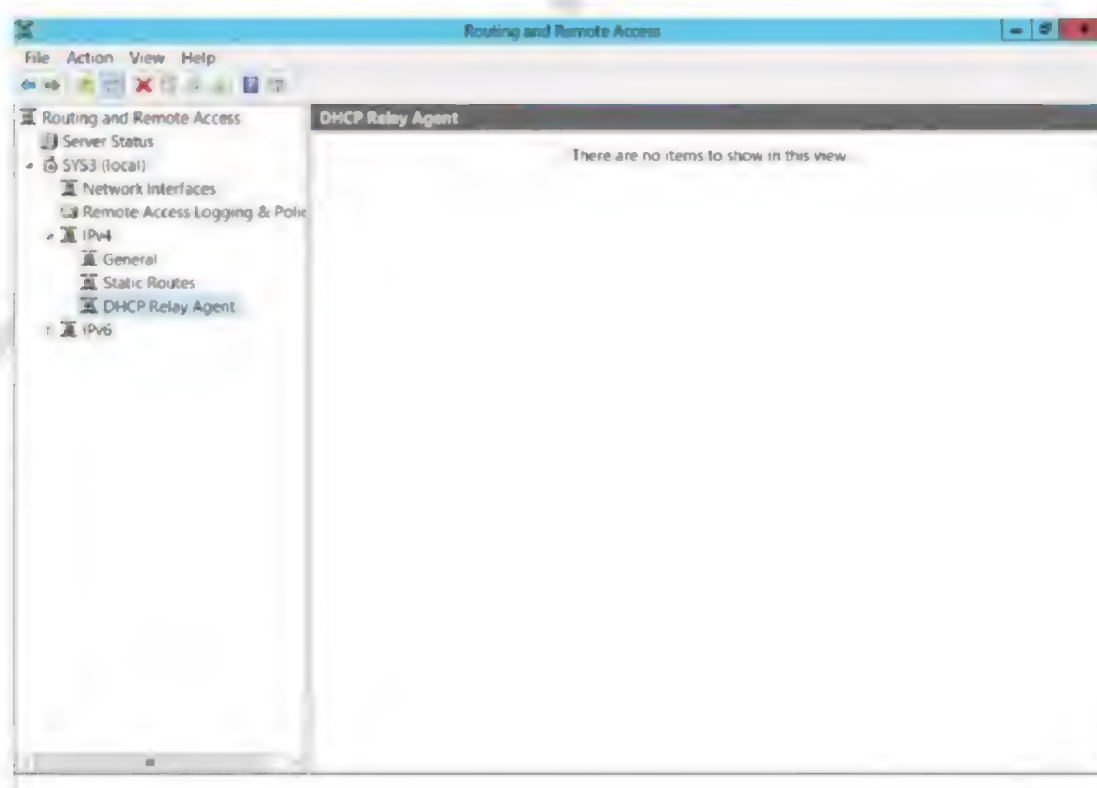
### On Router2

## SYS3-CONFIGURATION

1. Go to **Routing and Remote Access** → Expand **System name** → Expand **IPv4**
2. Right click **General** → Select **New Routing Protocol**
3. Select **DHCP Relay Agent** → click **OK**.

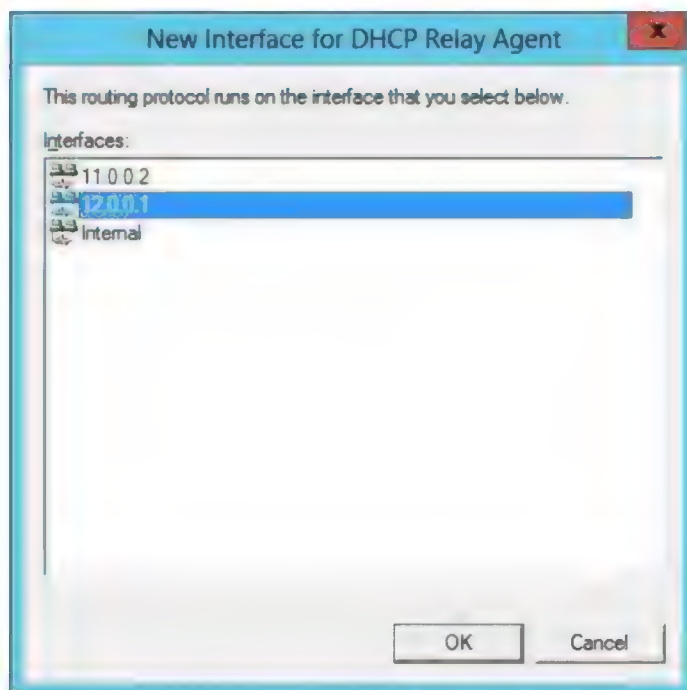


4. Right click on **DHCP Relay Agent**, Select **New Interface**.

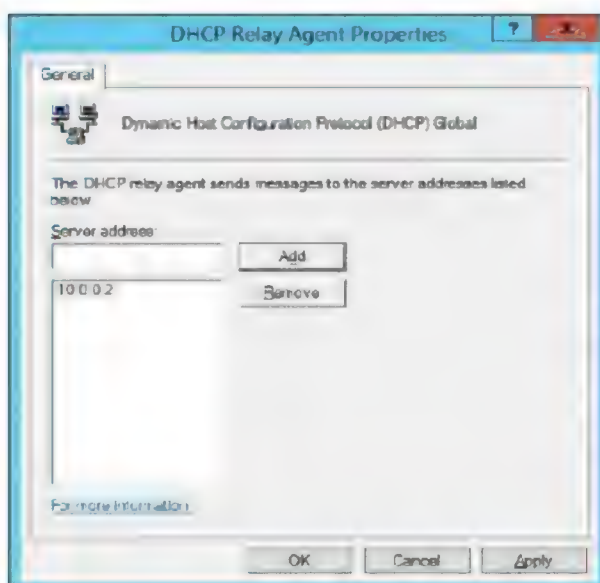




5. Select **12.0.0.1 Interface** → click **OK** → and click **OK**.



6. Right click on **DHCP Relay Agent** → **Properties** → Enter the IP Address of **DHCP Server (10.0.0.2)** → click **Add** → **Apply** and **OK**



### **Verification:**

#### **SYS4-CONFIGURATION**

1. Log on as **Administrator** to DHCP Client (**SYS4**) and set the IP address to **obtain the IP address automatically**.
2. Start → Run → Cmd → **Ipconfig /release**.
3. Type **Ipconfig /renew**.
4. An IP address will be assigned by DHCP server.
5. Check the IP Address by typing **Ipconfig /all**.



## Lab – 74: Configuring Remote Access Services (RAS)

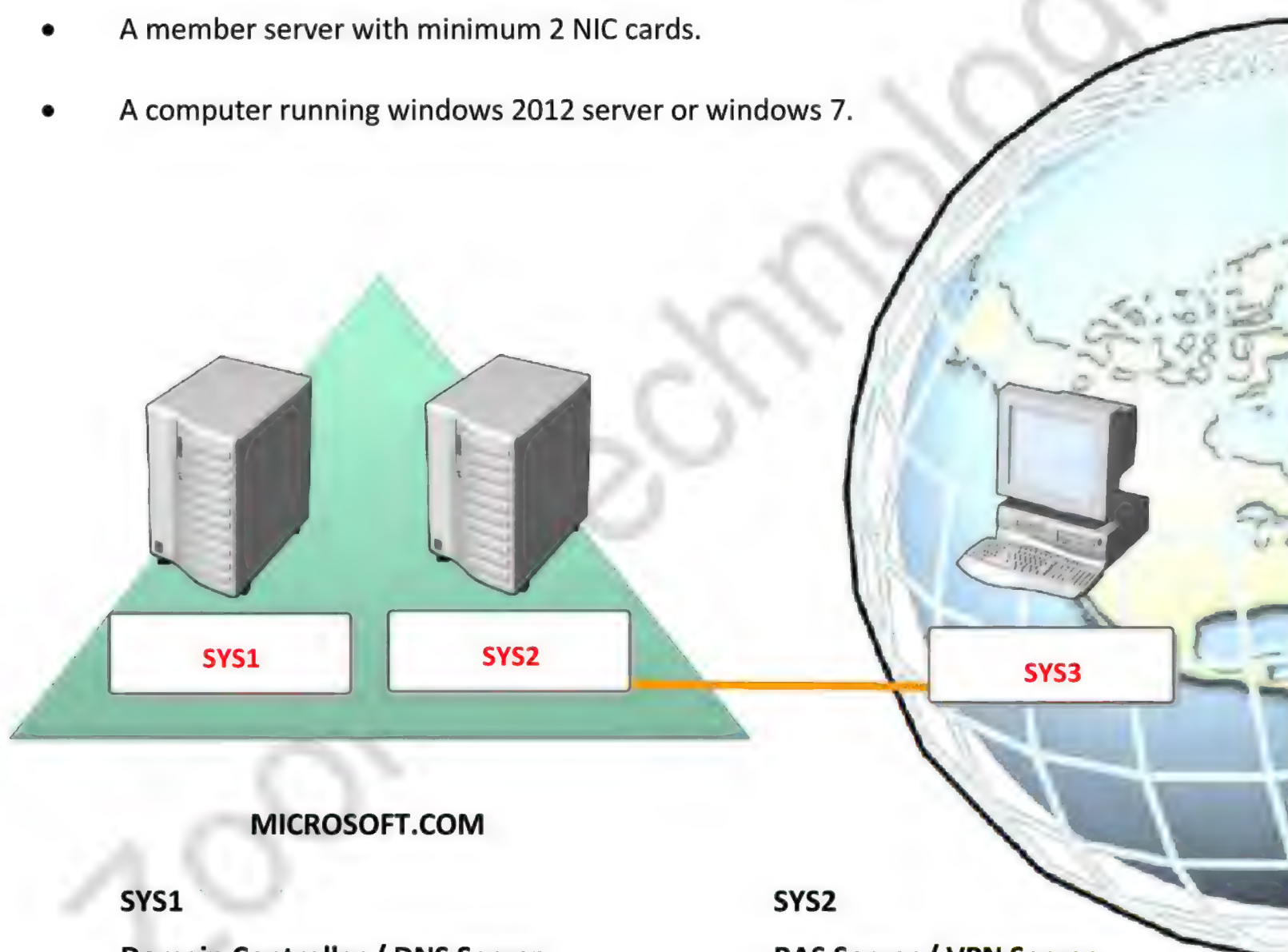
### Objective:

To allow remote users to connect to the corporate office LAN via VPN

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A member server with minimum 2 NIC cards.
- A computer running windows 2012 server or windows 7.



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#### SYS1

##### Domain Controller / DNS Server

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2

#### SYS3

##### VPN Client

IP Address	11.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	11.0.0.1

#### SYS2

##### RAS Server / VPN Server

IP Address	10.0.0.1, 11.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2

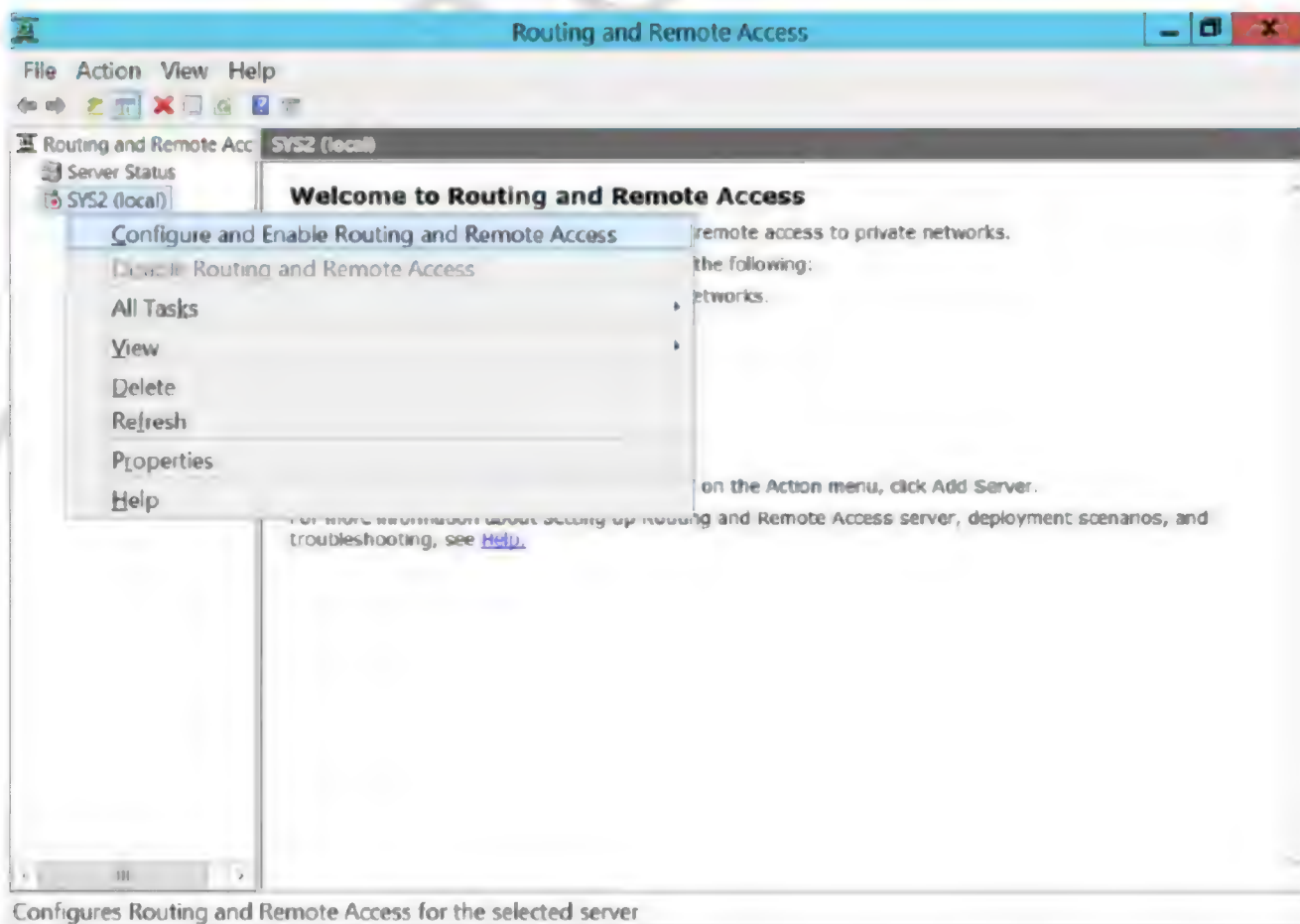
## Configuring VPN Server

### SYS2 – CONFIGURATION

1. Go to Start, select **Routing and Remote Access**.

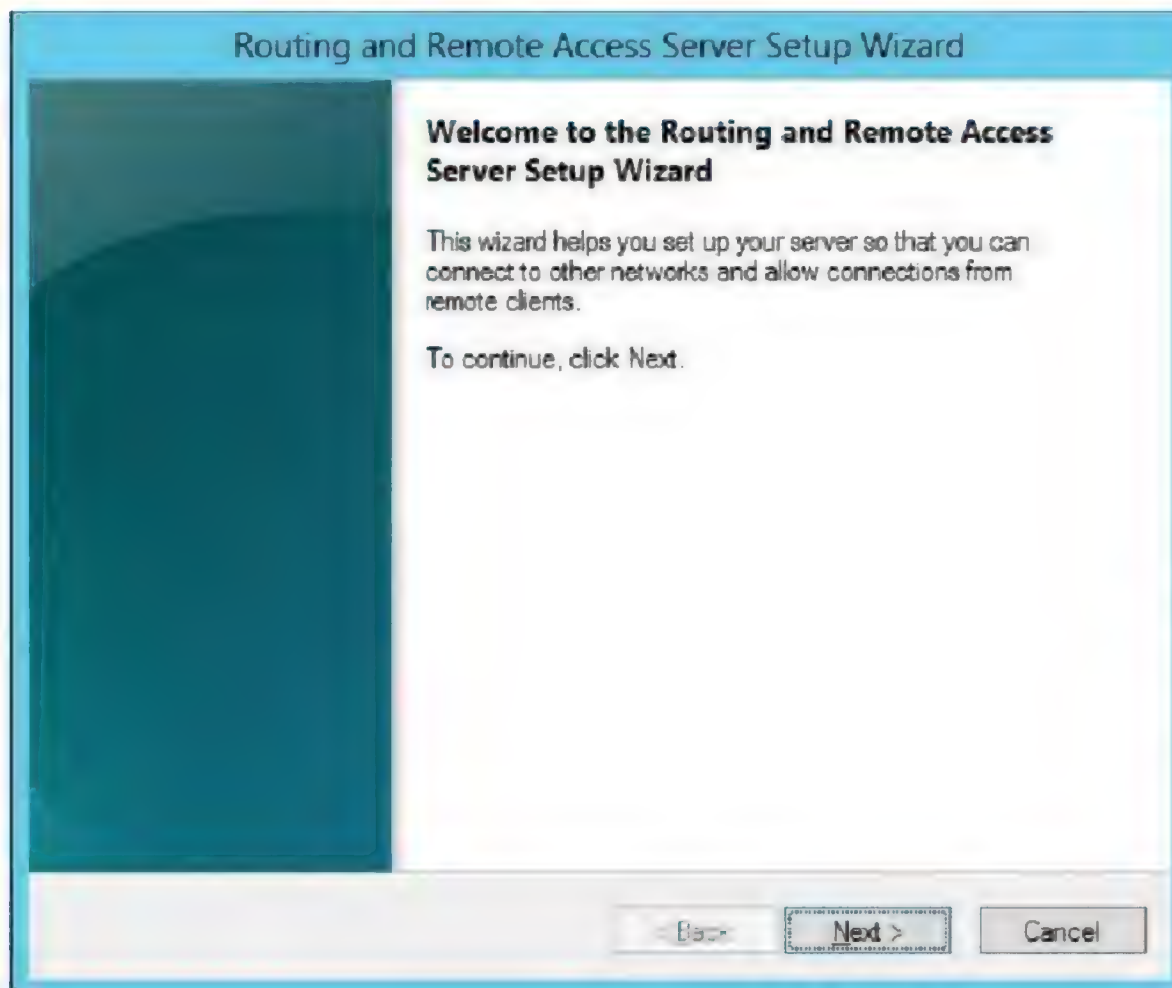


2. Right click on system name **Configure and Enable Routing and Remote Access**.

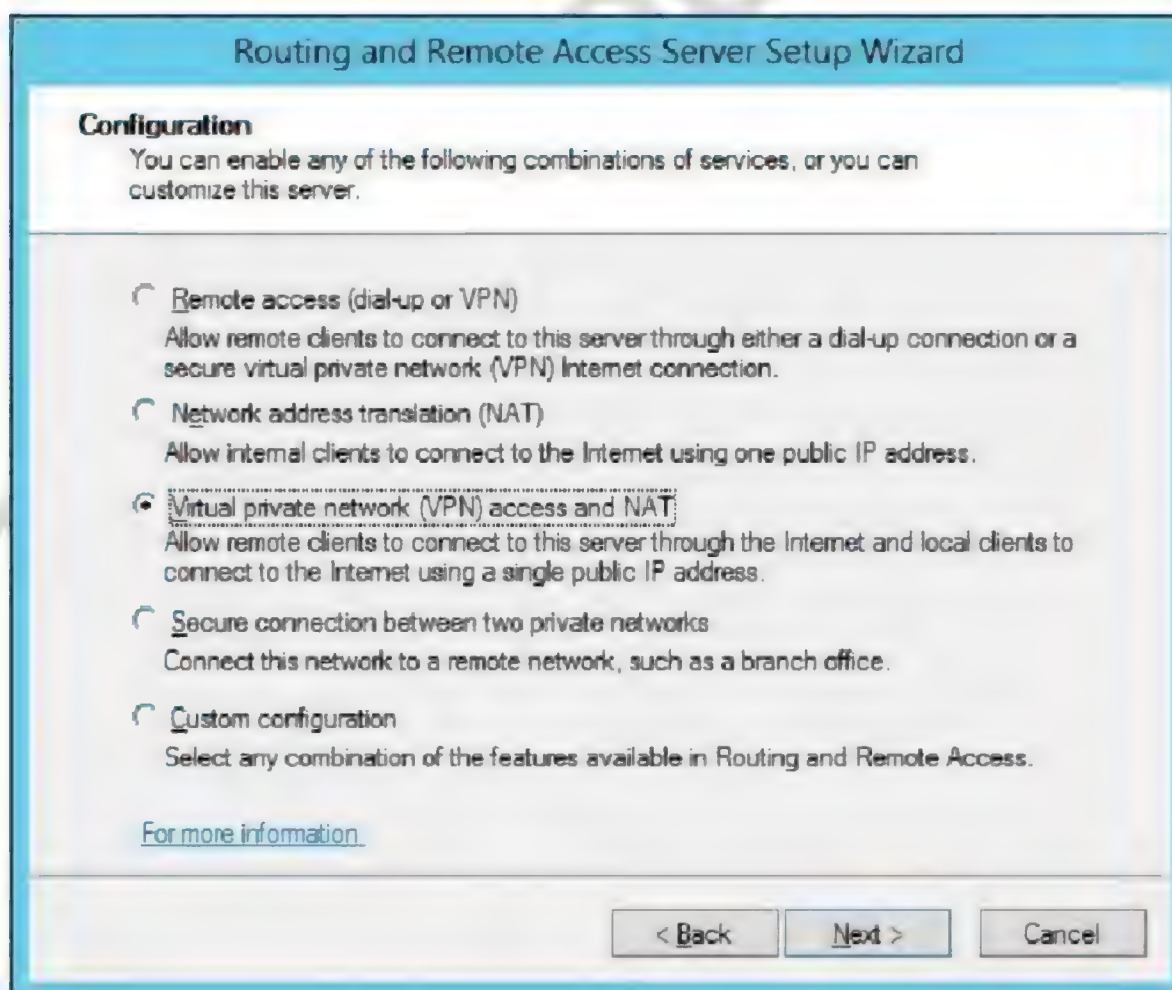




3. In Welcome wizard, click **Next**



4. Select Virtual private network (VPN) access and NAT → click **Next**.



5. Select Public interface (Ex: 11.0.0.1) → click **Next**.

**Routing and Remote Access Server Setup Wizard**

**VPN Connection**  
To enable VPN clients to connect to this server, at least one network interface must be connected to the Internet.

Select the network interface that connects this server to the Internet.

Network interfaces:

Name	Description	IP Address
10.0.0.1	D-Link DFE-520TX PCI ...	10.0.0.1
<b>11.0.0.1</b>	<b>NVIDIA nForce Network ...</b>	<b>11.0.0.1</b>

[For more information about network interfaces.](#)  
[For more information about packet filtering.](#)

< Back   Next >   Cancel

6. Select From a specified range of address (if DHCP is not configured in the private network, select automatically if DHCP is configured), click **Next**.

**Routing and Remote Access Server Setup Wizard**

**IP Address Assignment**  
You can select the method for assigning IP addresses to remote clients.

How do you want IP addresses to be assigned to remote clients?

☐ Automatically  
If you use a DHCP server to assign addresses, confirm that it is configured properly.  
If you do not use a DHCP server, this server will generate the addresses.

☒ From a specified range of addresses

[For more information](#)

< Back   Next >   Cancel



7. Enter the IP Address range to be leased to VPN Clients (Ex: 10.0.0.100 to 10.0.0.200), click **OK**.



**New IPv4 Address Range**

Type a starting IP address and either an ending IP address or the number of addresses in the range.

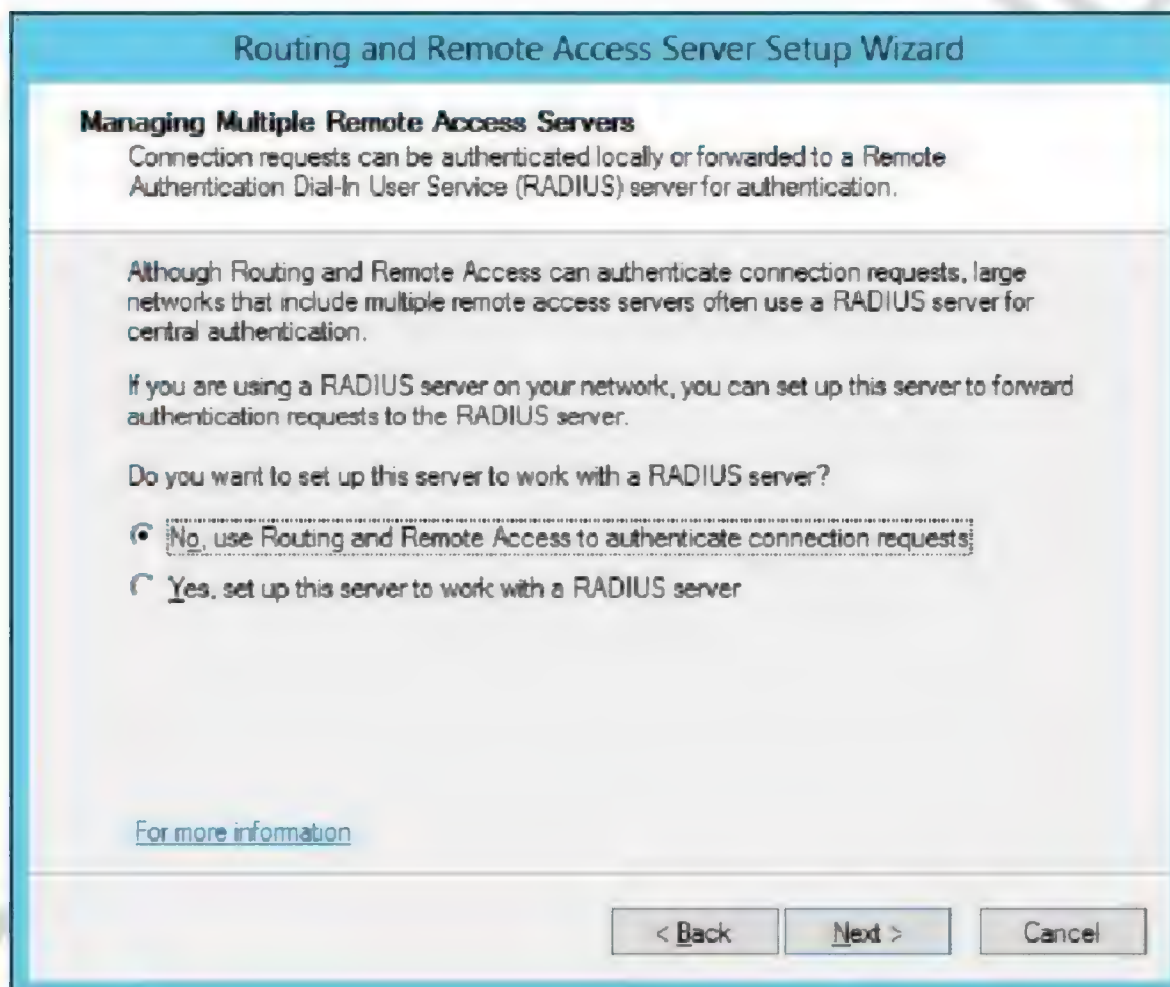
Start IP address: 10 . 0 . 0 . 100

End IP address: 10 . 0 . 0 . 200

Number of addresses: 101

OK Cancel

8. Select No, use Routing and Remote Access to authenticate connection requests (if VPN Server is Member Server), click **Next**.



**Routing and Remote Access Server Setup Wizard**

**Managing Multiple Remote Access Servers**

Connection requests can be authenticated locally or forwarded to a Remote Authentication Dial-In User Service (RADIUS) server for authentication.

Although Routing and Remote Access can authenticate connection requests, large networks that include multiple remote access servers often use a RADIUS server for central authentication.

If you are using a RADIUS server on your network, you can set up this server to forward authentication requests to the RADIUS server.

Do you want to set up this server to work with a RADIUS server?

☒ No, use Routing and Remote Access to authenticate connection requests

☐ Yes, set up this server to work with a RADIUS server

[For more information](#)

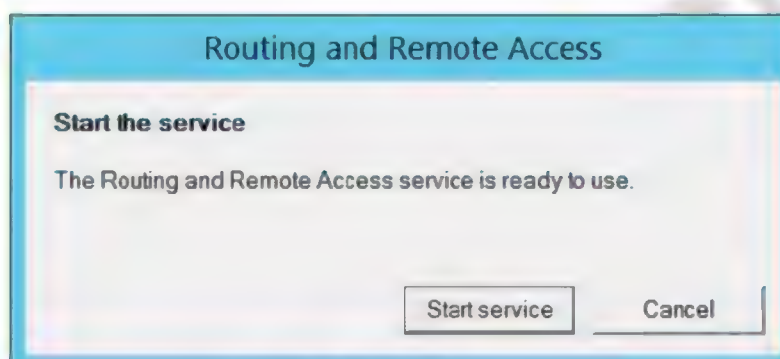
< Back Next > Cancel



9. Click **Finish**



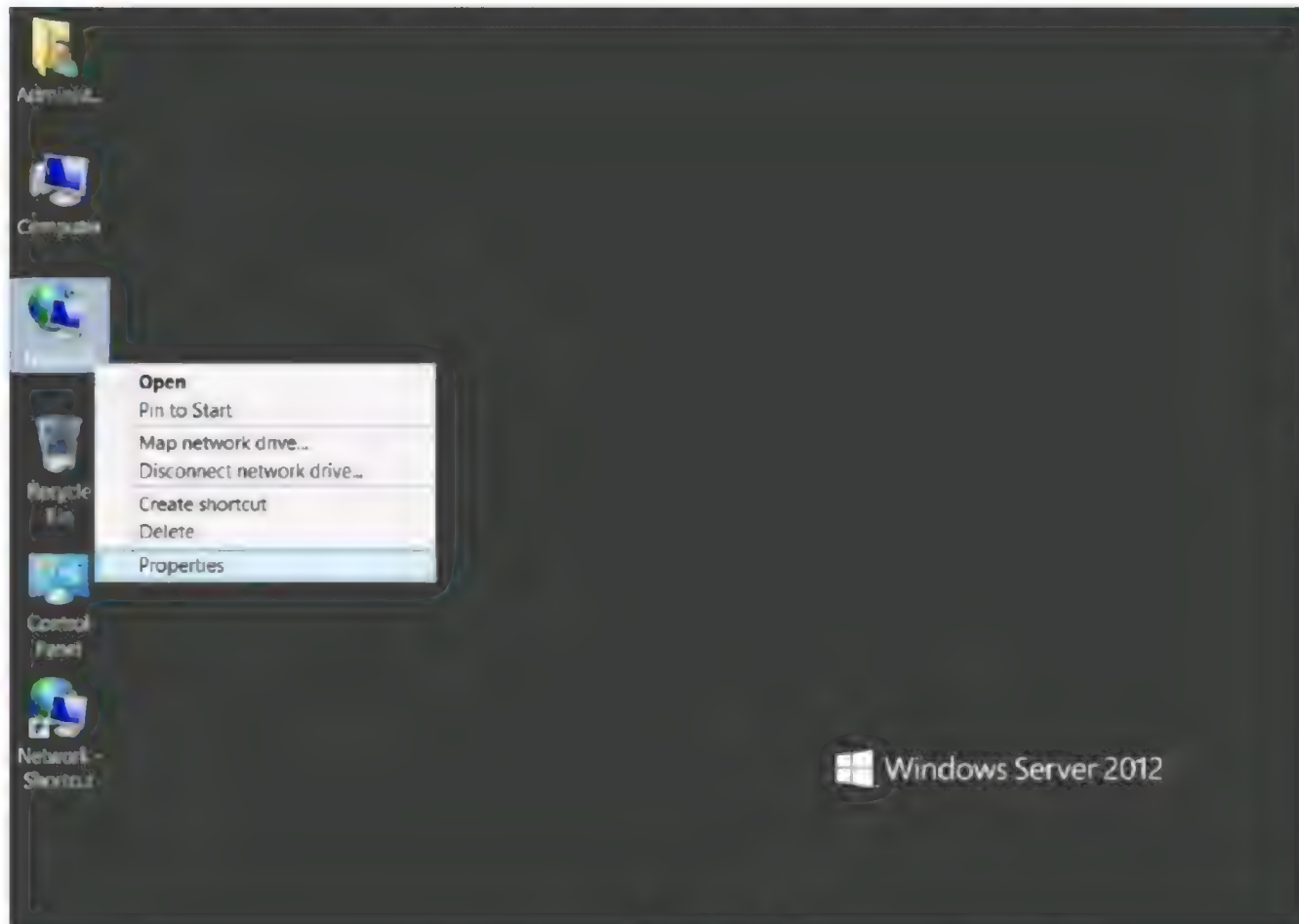
10. Click **Start service**



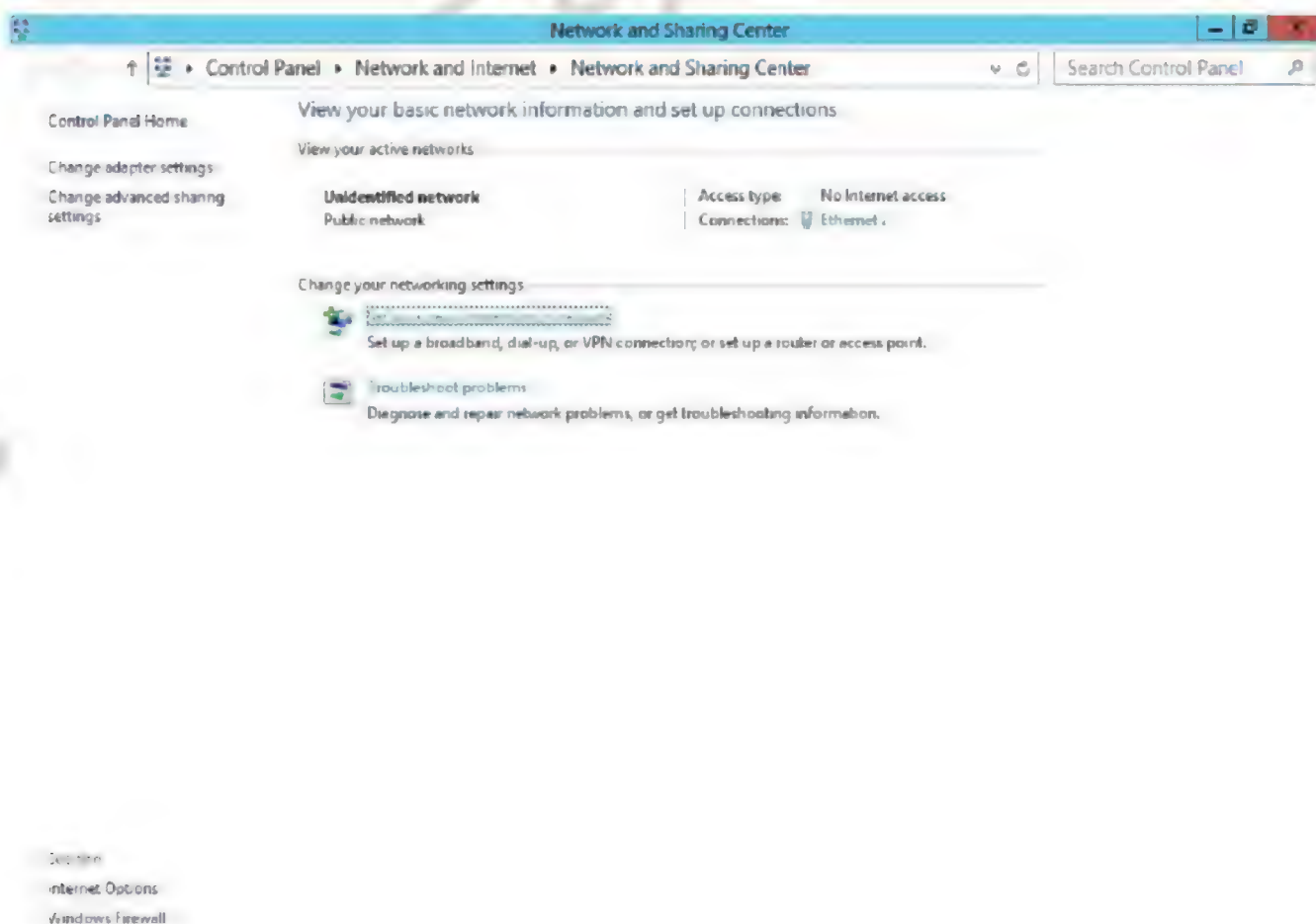
## Establishing VPN Connections

### SYS3 – CONFIGURATION

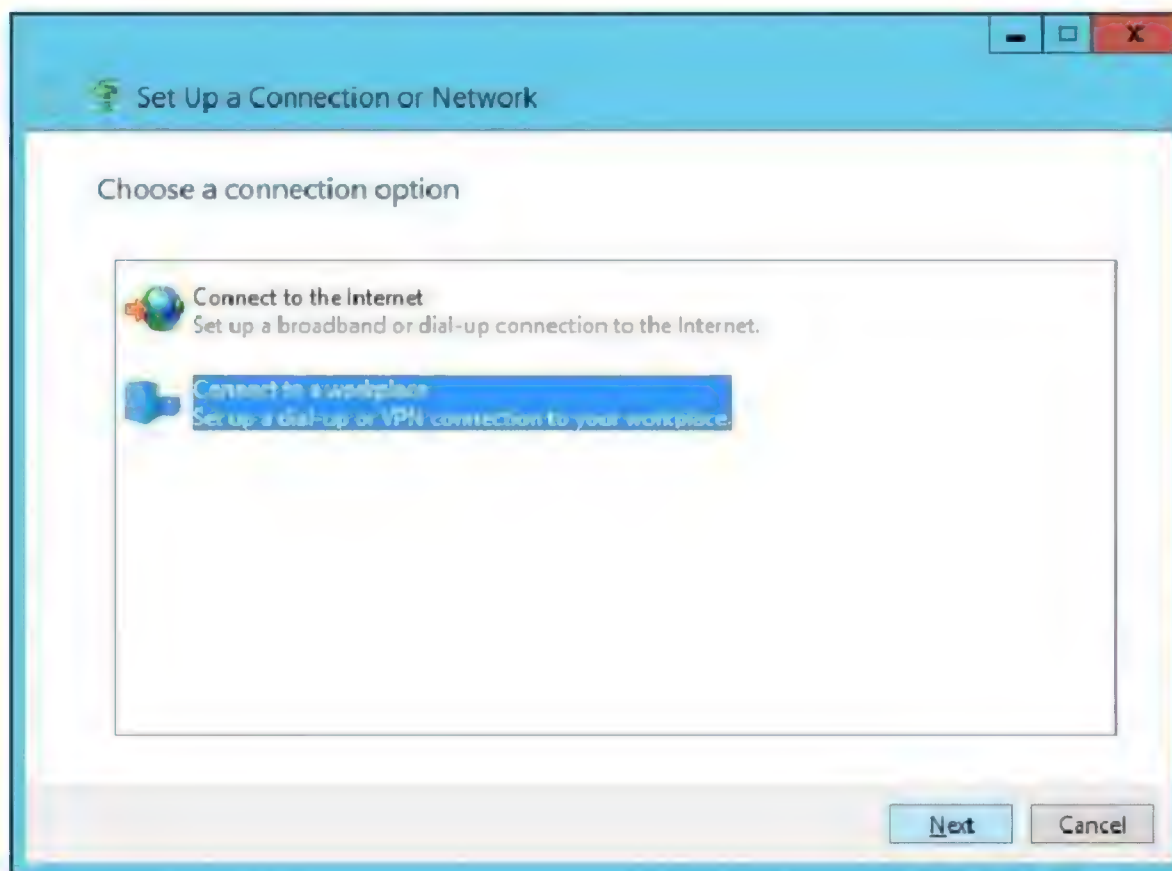
1. Log on to **RAS Client (SYS3)**, Right click on **Network icon** → **Properties**.



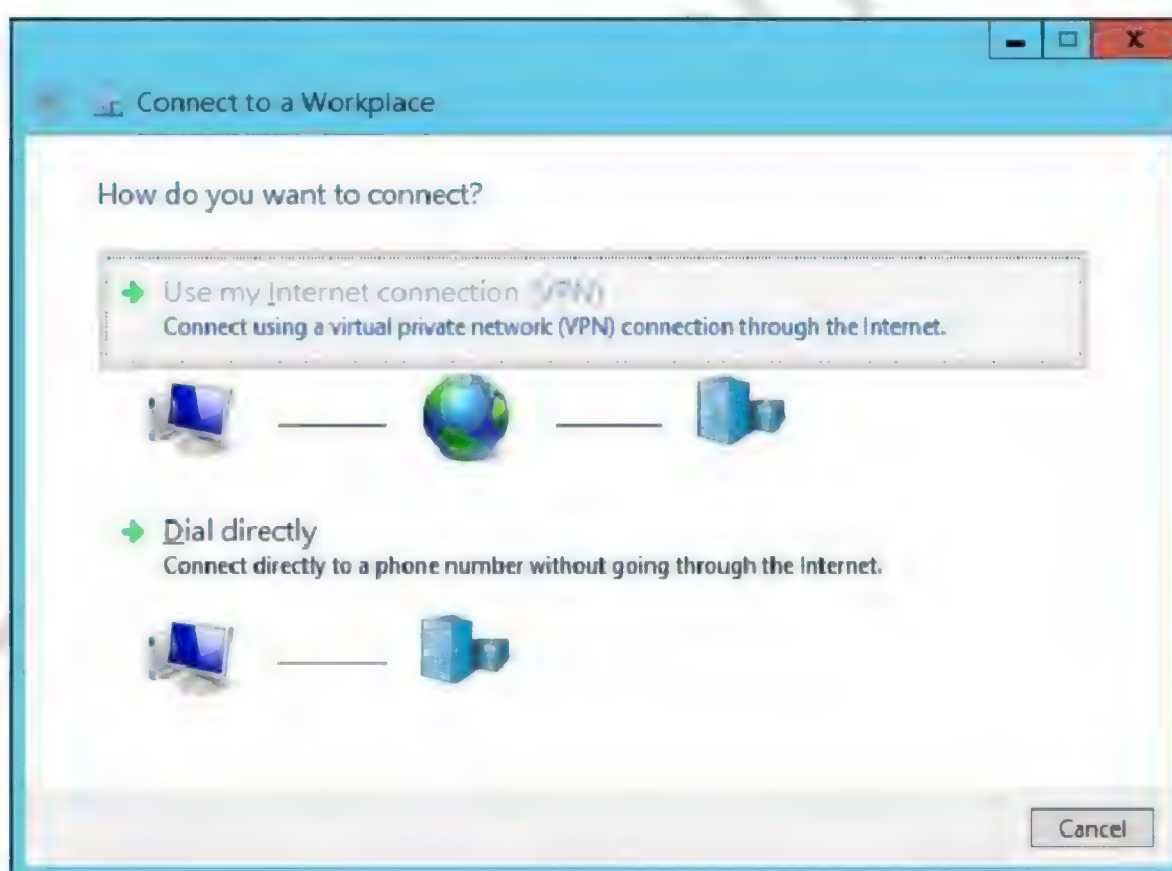
2. Select **Set up a Connection or network**



3. Connect to a workplace → click **Next**.

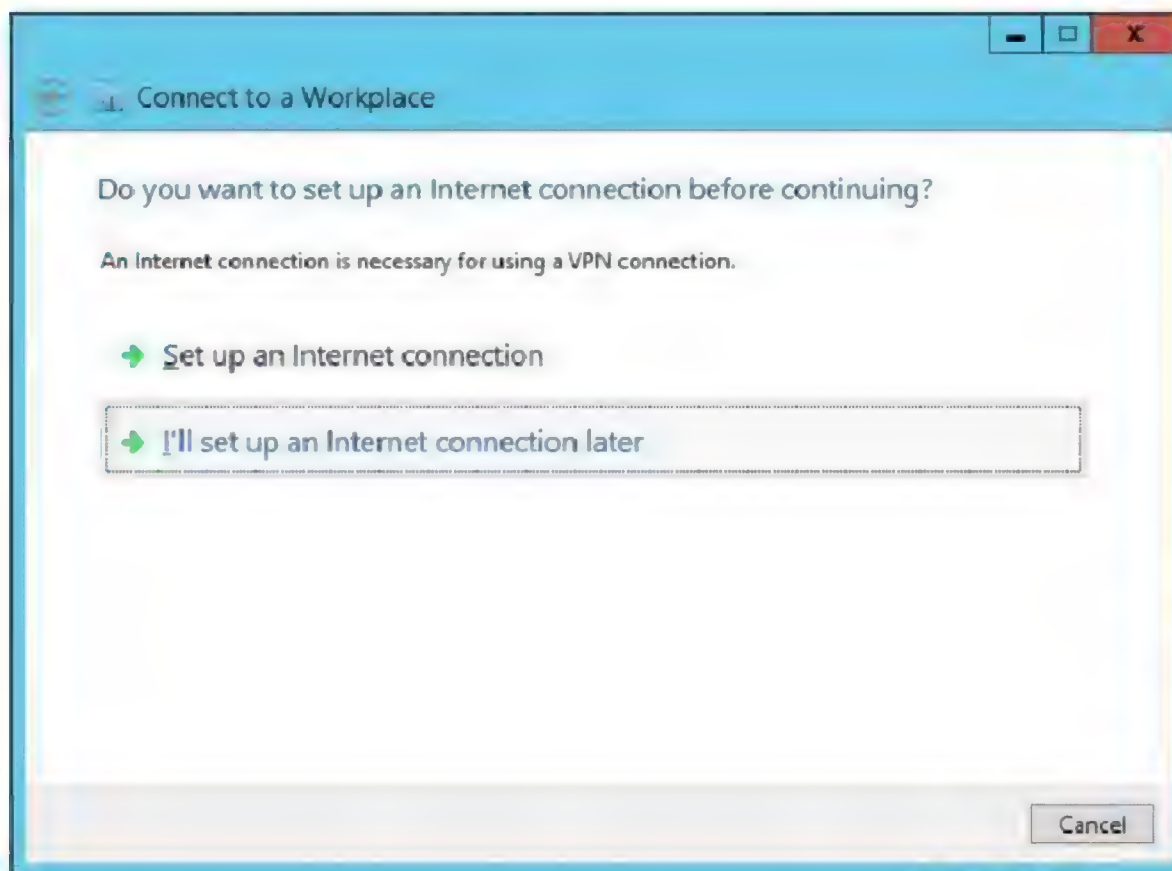


4. Select **Use my Internet connection (VPN)** → click **Next**.

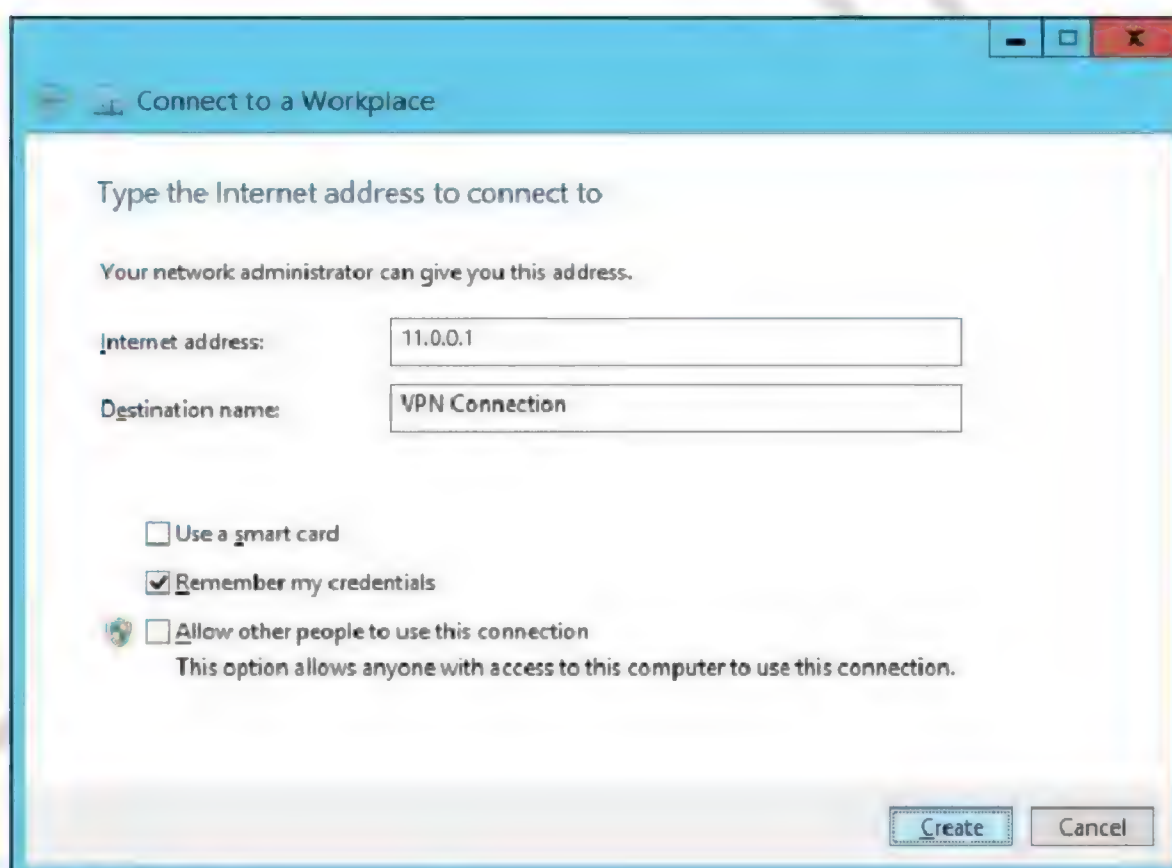




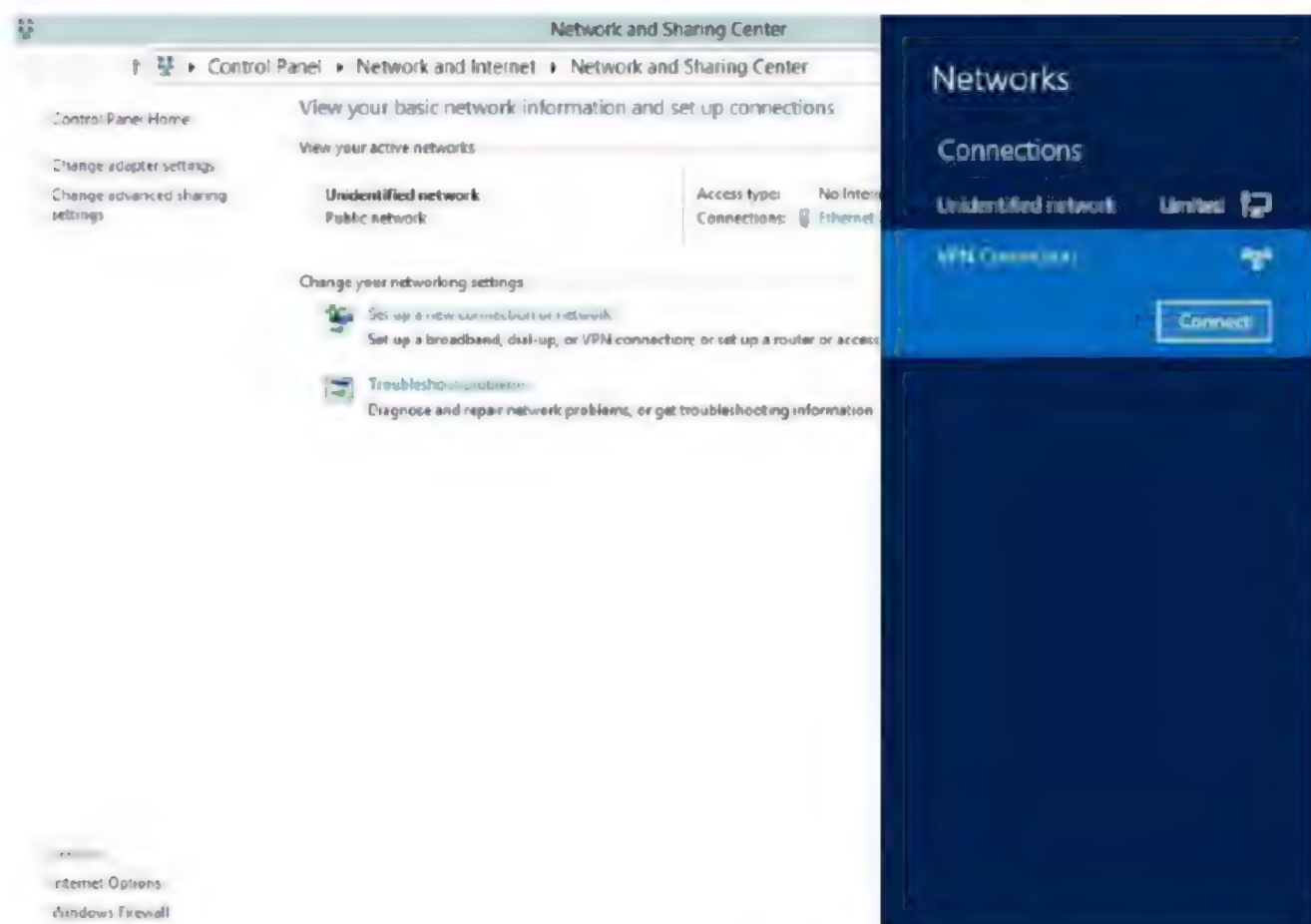
5. Select **Use this Connection** → click **Next**.



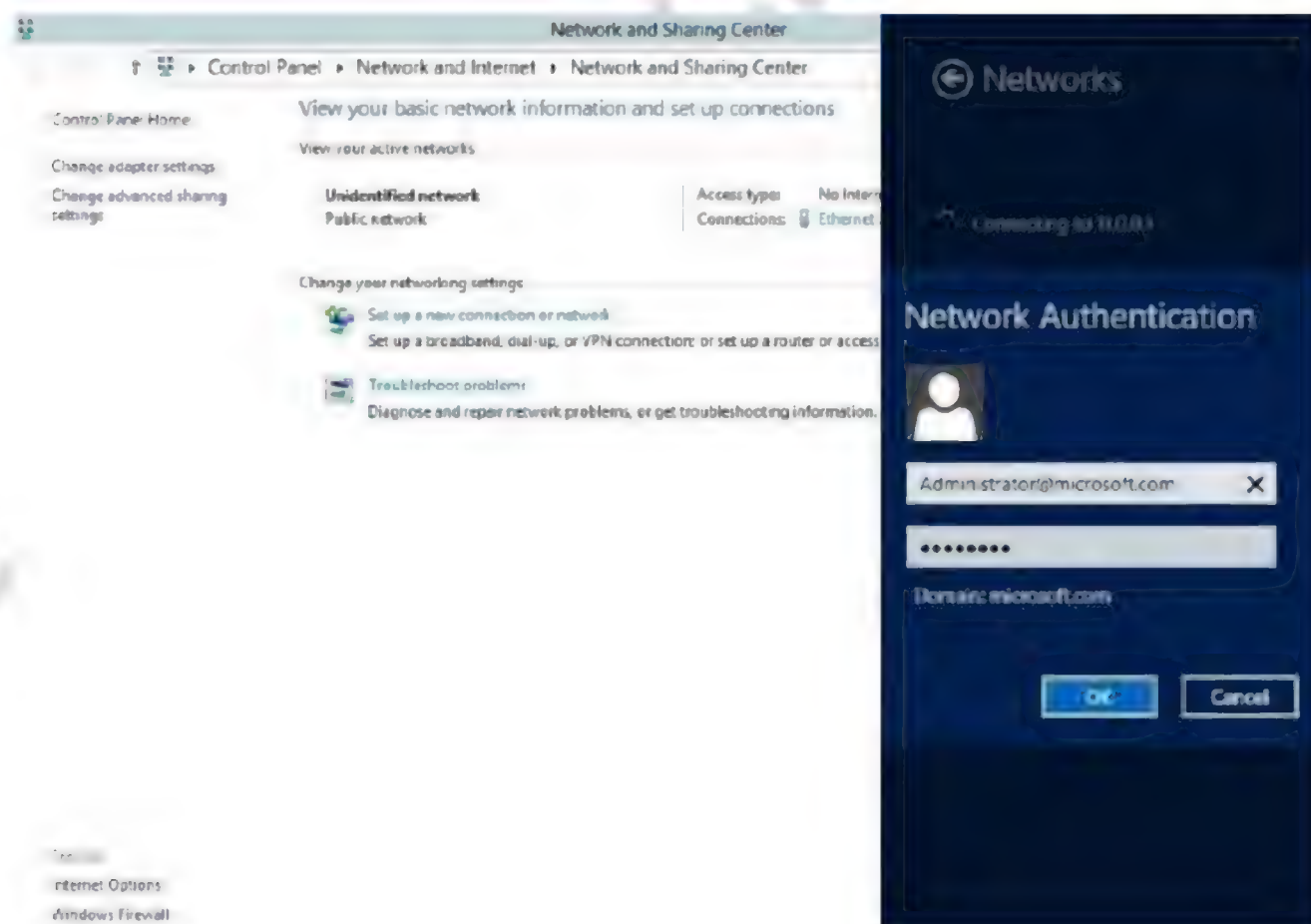
6. Mention the **IP Address of VPN Server** → click **Next**



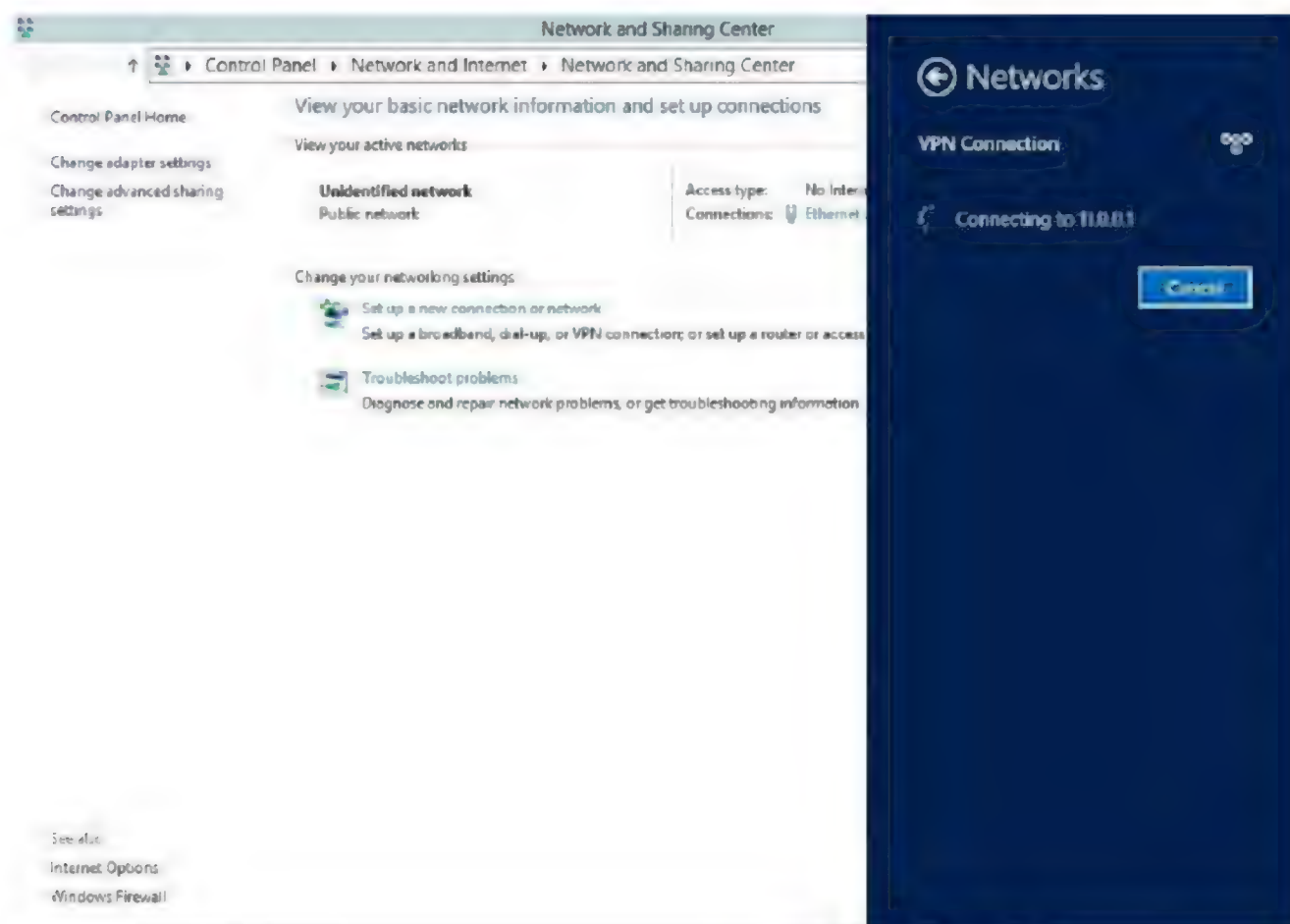
7. Click VPN Connection → click **Connect**.



8. Enter Network Authentication, (Ex: [Administrator@microsoft.com](mailto:Administrator@microsoft.com)) and Password click **OK**.



9. Connection is created successfully.



10. Go to **Command prompt** & type **Ipconfig /all** to view the IP Address of the Client computer.

11. **Now try to access the LAN Network.**

12. Go to Start → Run → type **\\LAN computer IP address\Drive\$** or Share folder name

Ex: **\\10.0.0.2\c\$**



## Lab – 75: Configuring Remote Desktop Services

### Objective:

To access a server desktop remotely by enabling remote desktop connections

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A computer running windows 2012 server or windows 7.

### Topology :



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#### SYS1

##### D.C. / Remote Desktop Server

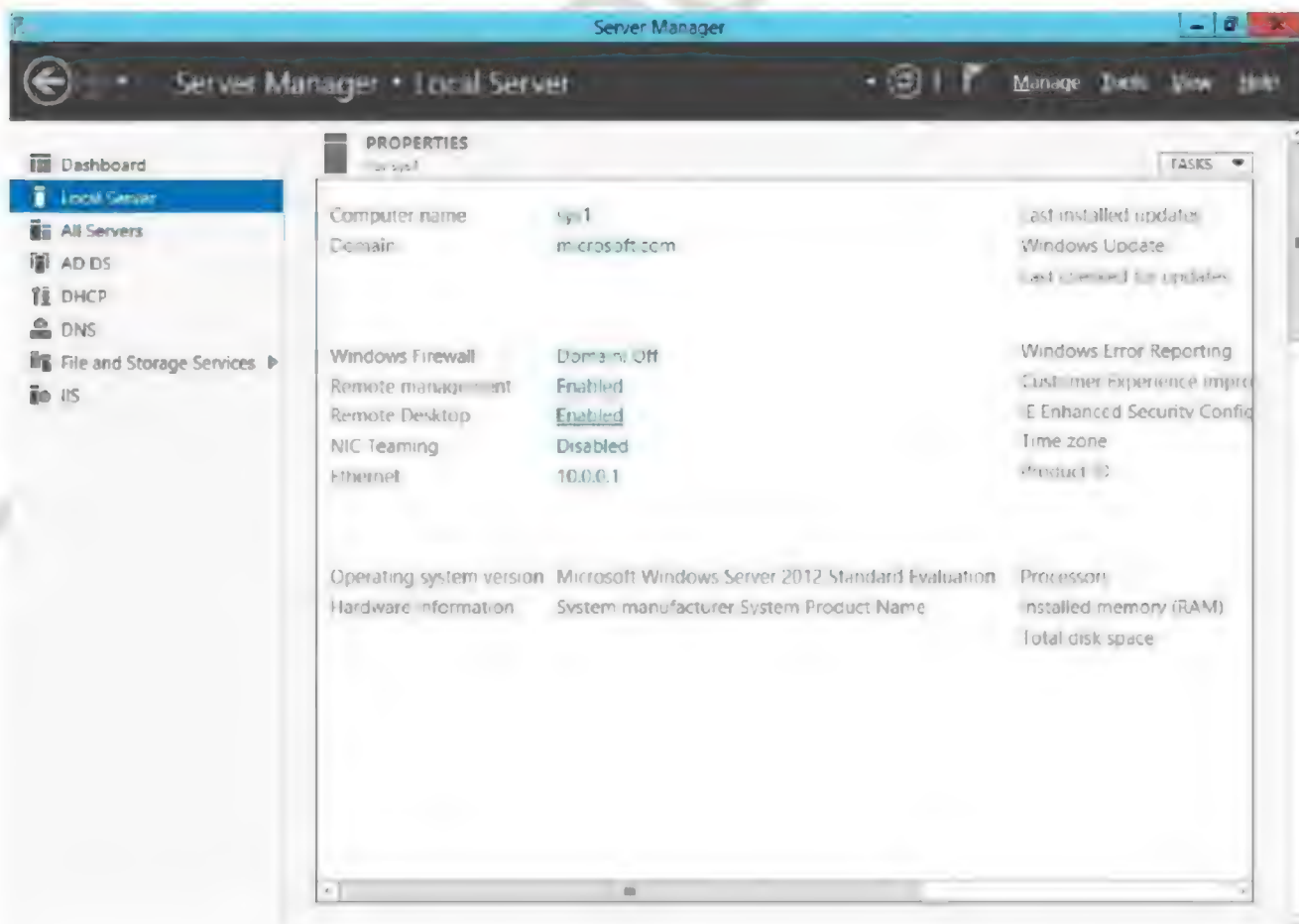
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

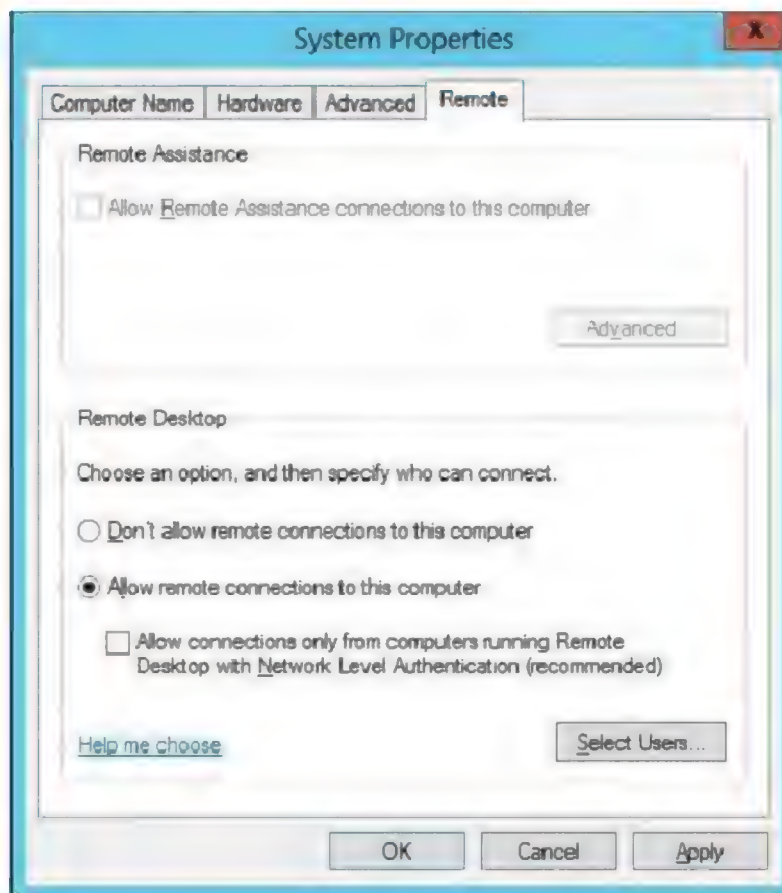
##### Member Server / Client

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred dns	10.0.0.1



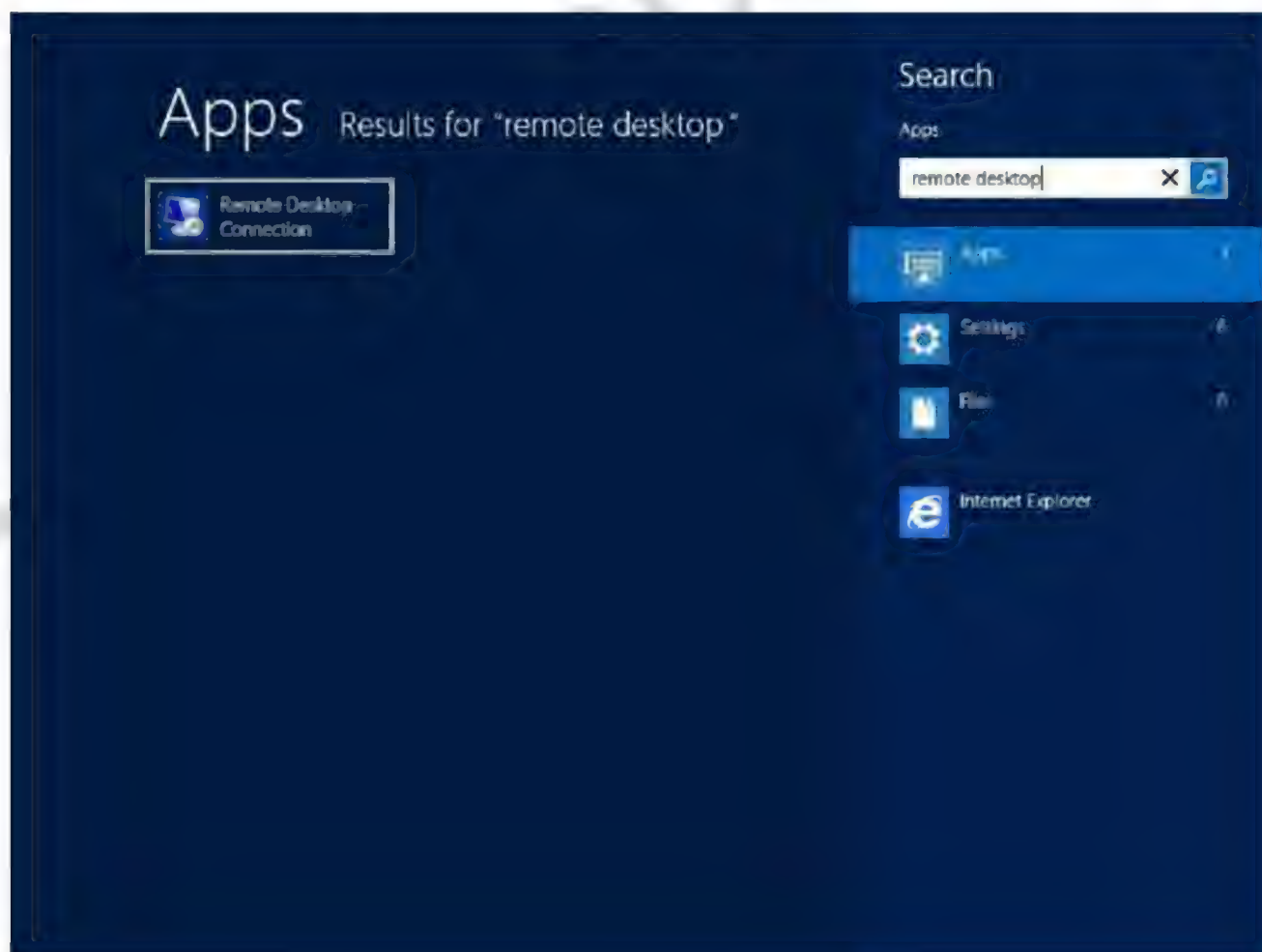
**SYS1 – CONFIGURATION****1. Select Server Manager****2. Select Remote Settings.**

4. Check the box **"Allow Connections from computers running any version"**.



#### Go to Terminal Client (SYS2)

1. Go to Start, Type Remote Desktop Connection in search in Apps, select **Remote Desktop Connection**.





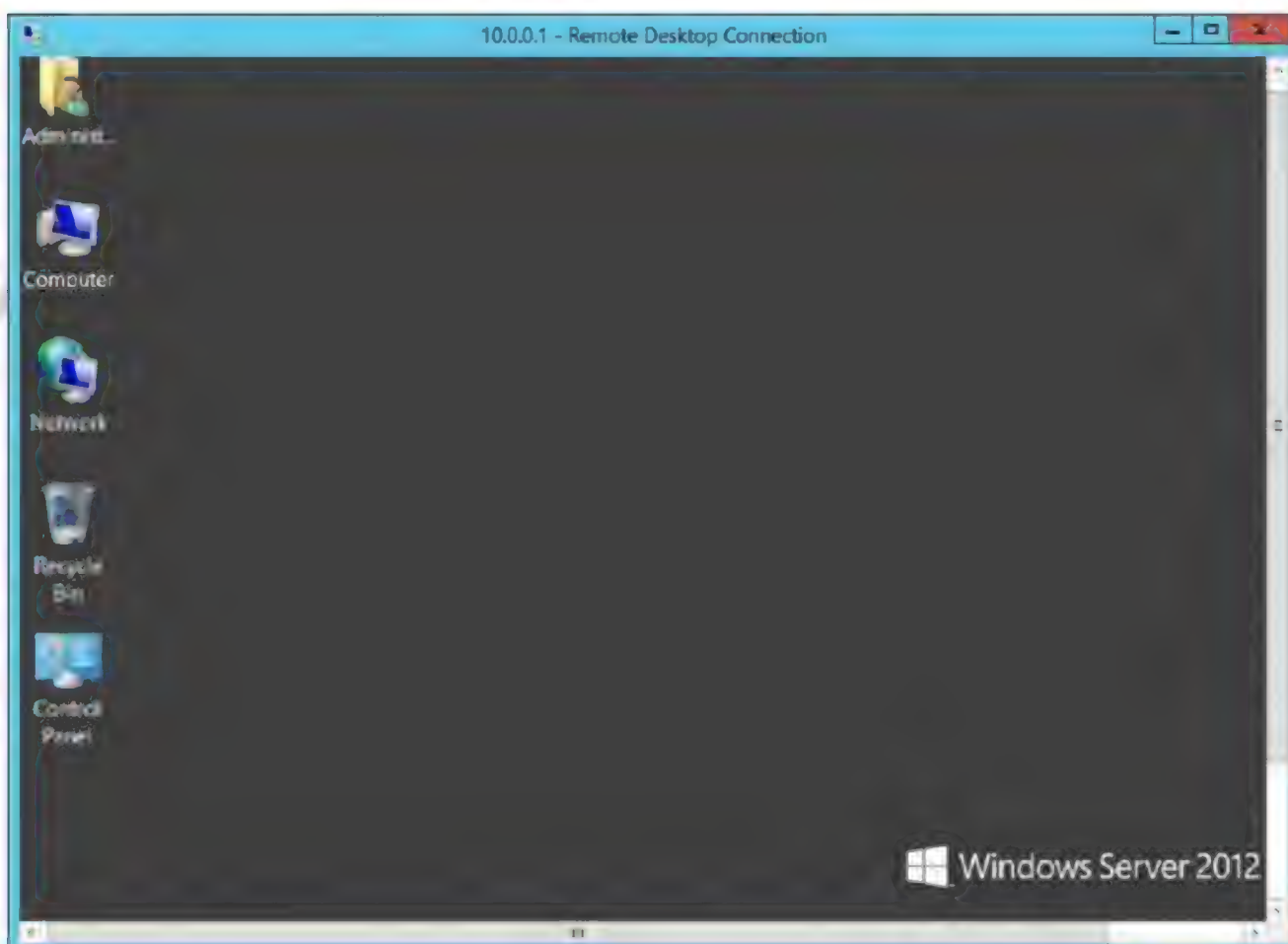
2. Specify the IP Address 10.0.0.1 or computer name of terminal server → click **Connect**.



3. Specify username as **Administrator** and type the password. → click **OK**



4. The **Administrator** will connect to the Terminal Server Remotely.



## Lab – 76: Hypertext Transfer Protocol Over Secure Socket Layer

### Objective:

To host HTTPS website using SSL certificate

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller/web server.
- A computer running windows 2012 server or Windows 7.

### Topology:



#### SYS1

##### Domain Controller/DNS/Web Server

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2

##### Member Server / Client

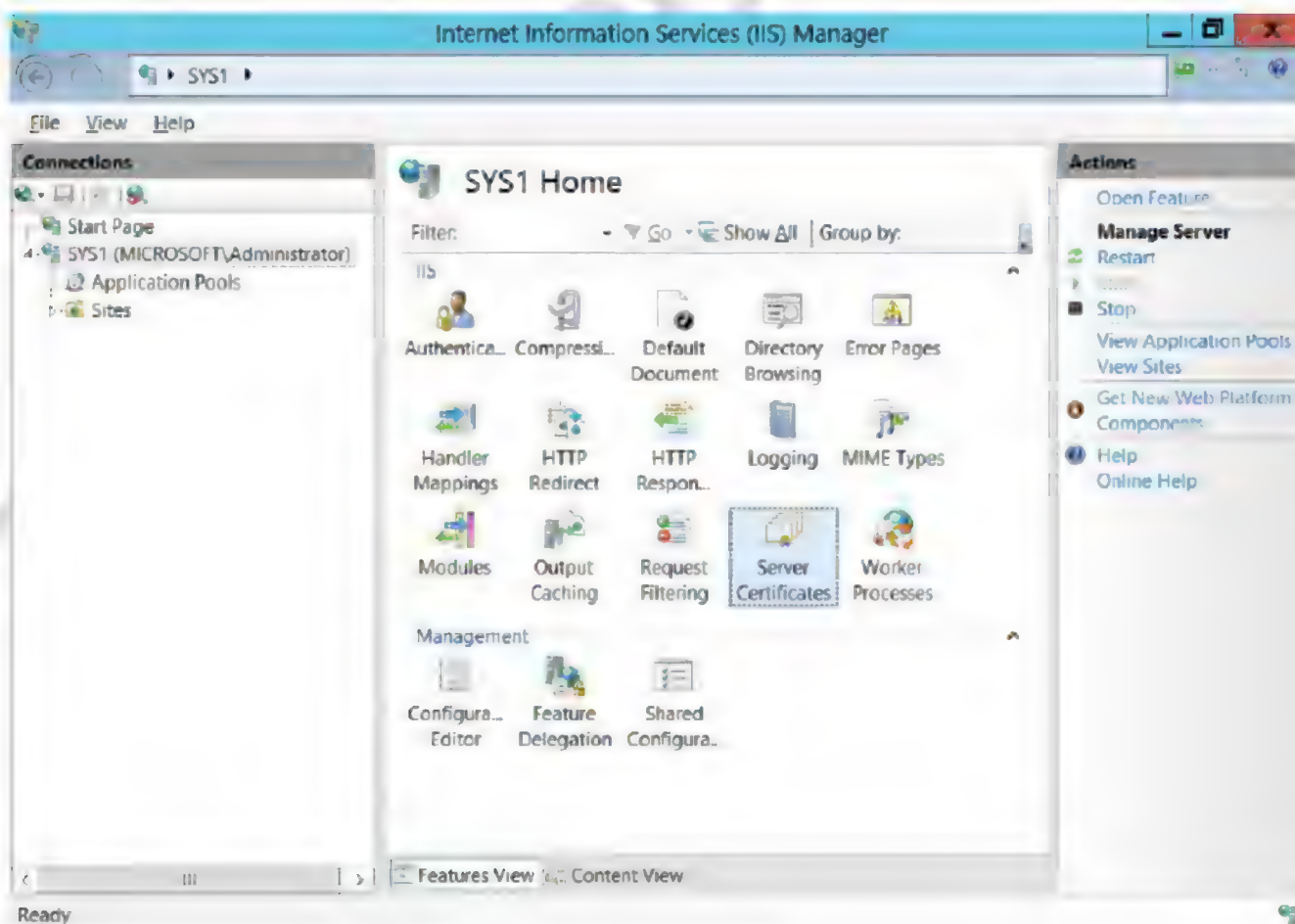
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

## Creating a self signed certificate

1. Go to Start, select **Internet Information Services Manager**.

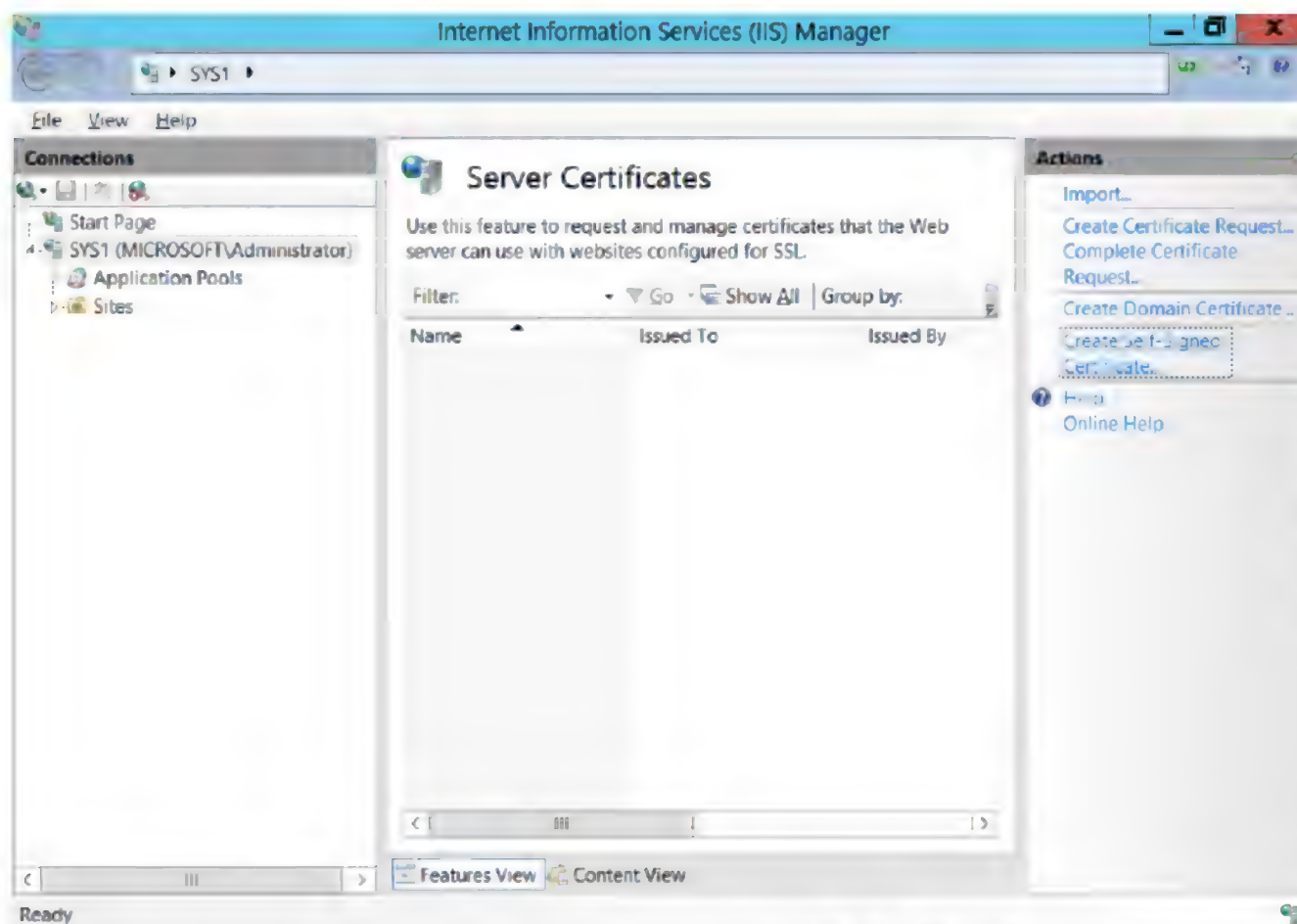


2. Select the system name (Ex: SYS1), and select **ServerCertificates**.

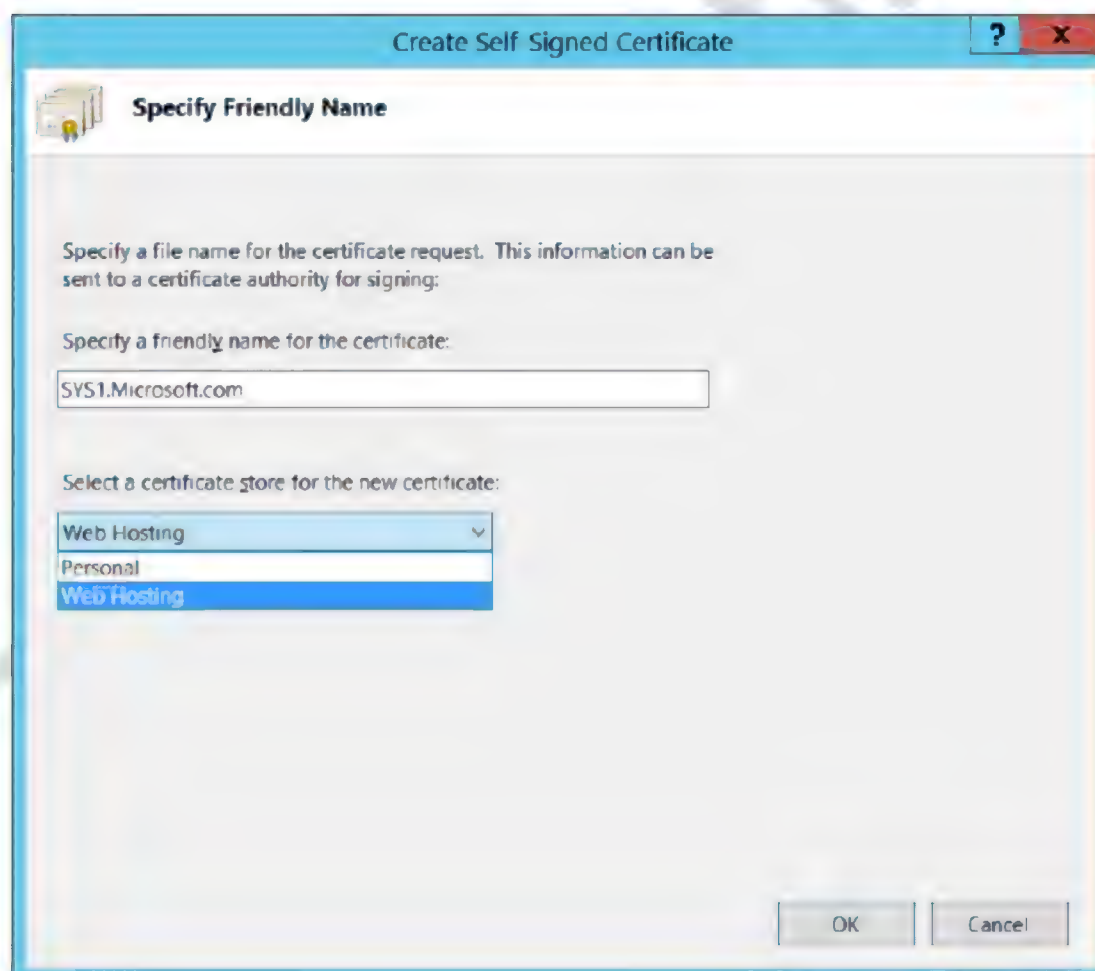




3. In Server Certificates, click **Create Self-Signed Certificate**, from Actions pane.

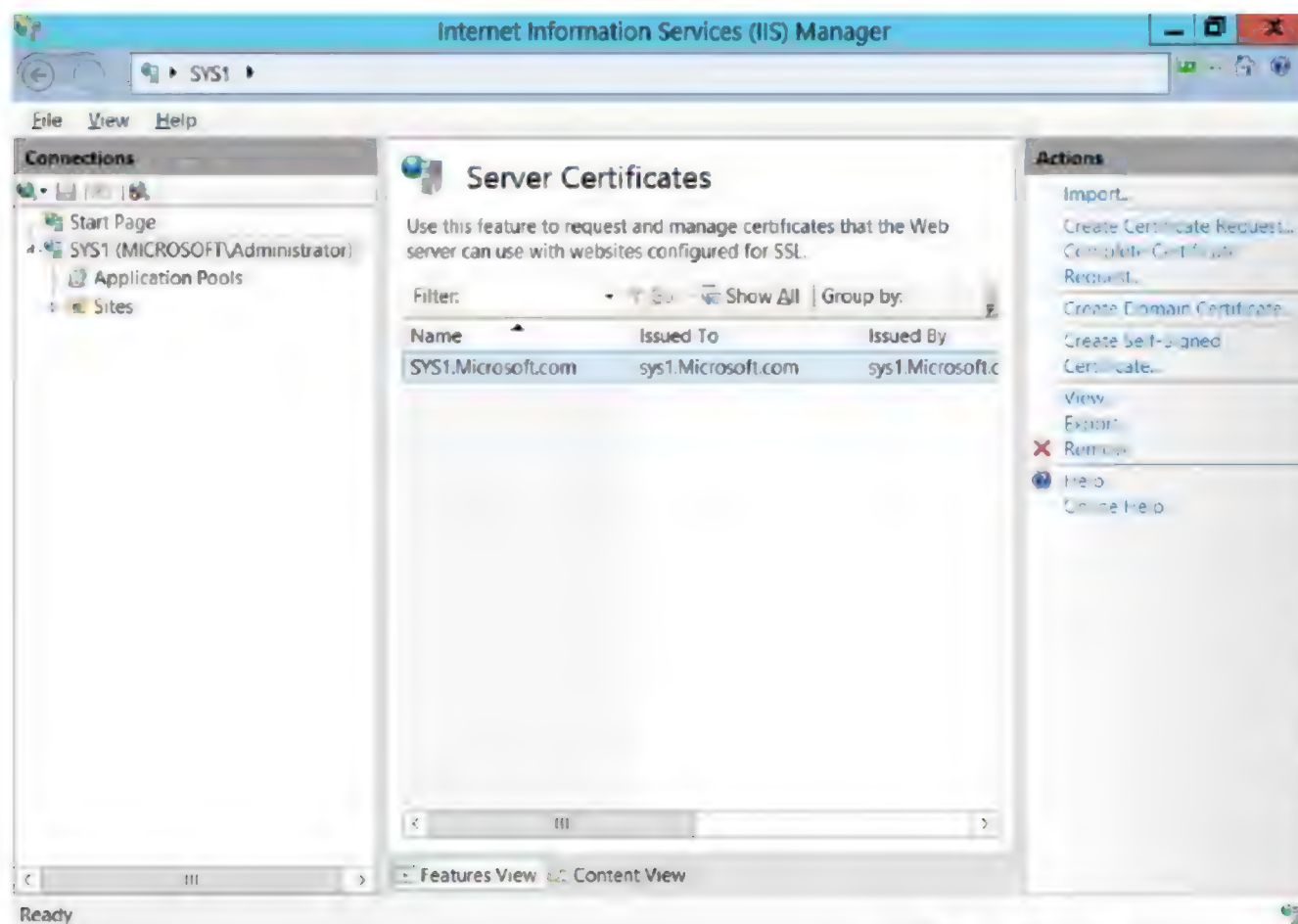


4. Mention the Certificate name (Ex: SYS1.Microsoft.com), select **Web Hosting**.



5. Click **OK**.

6. Certificate is created

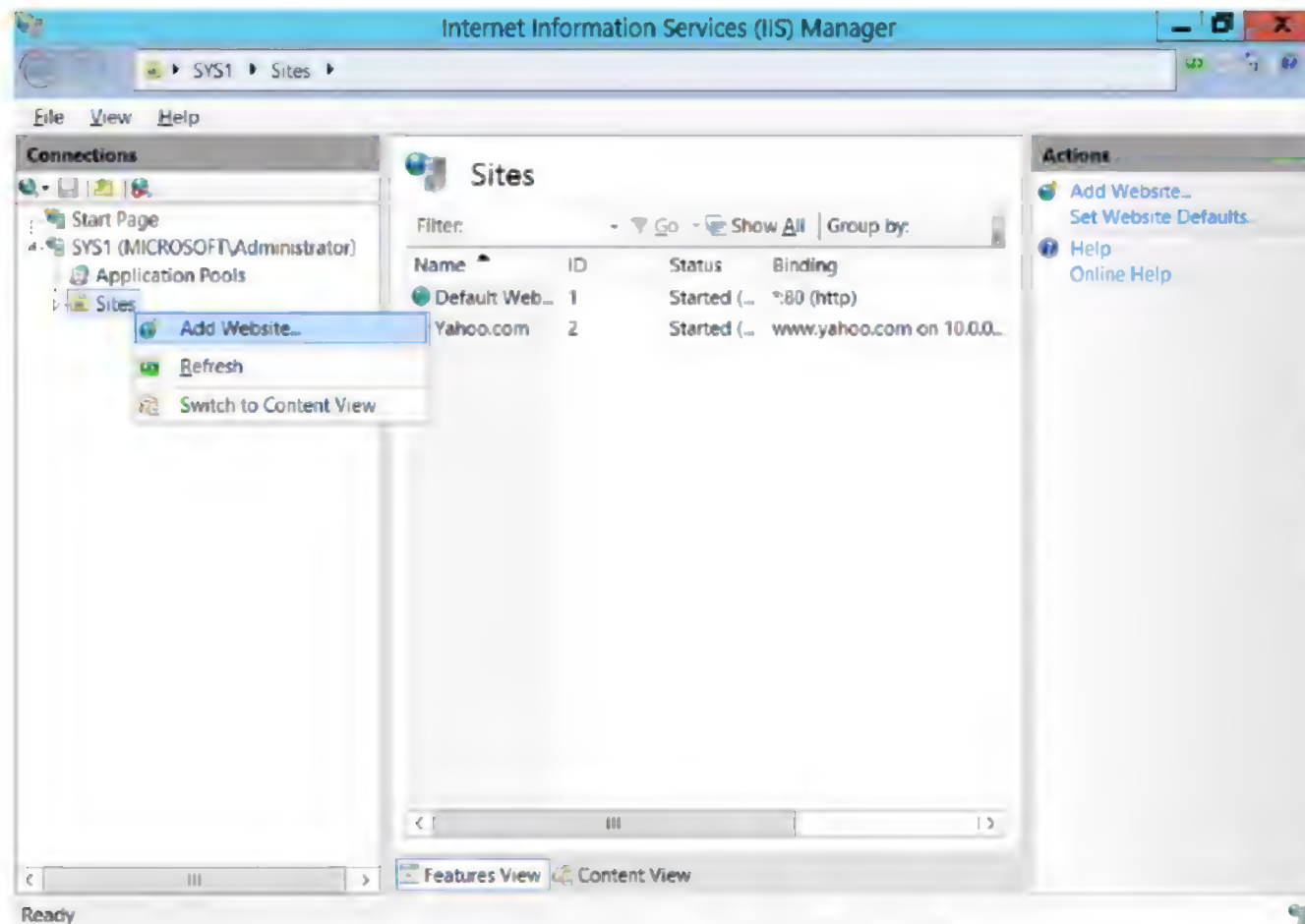


## Creating a HTTPS Web Site

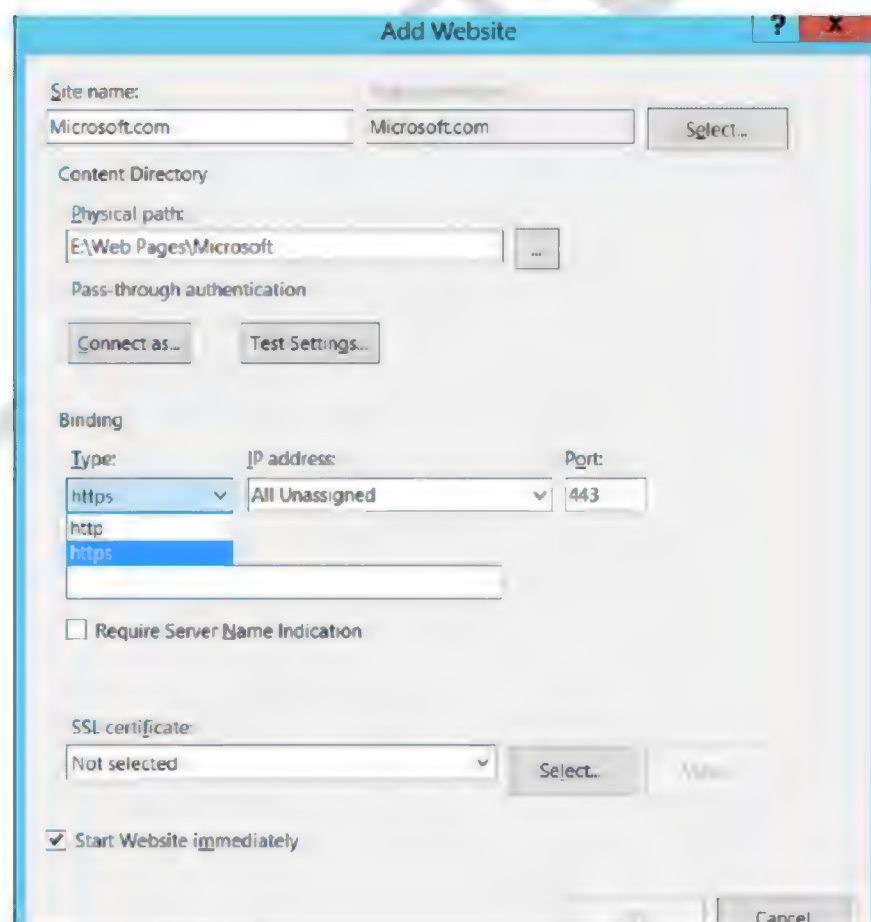
1. Go to Start, select **Internet Information Services Manager**.



2. In the left pane of the **Internet Information Services**, Expand the server → Right click on sites and select **Add Web Site**.

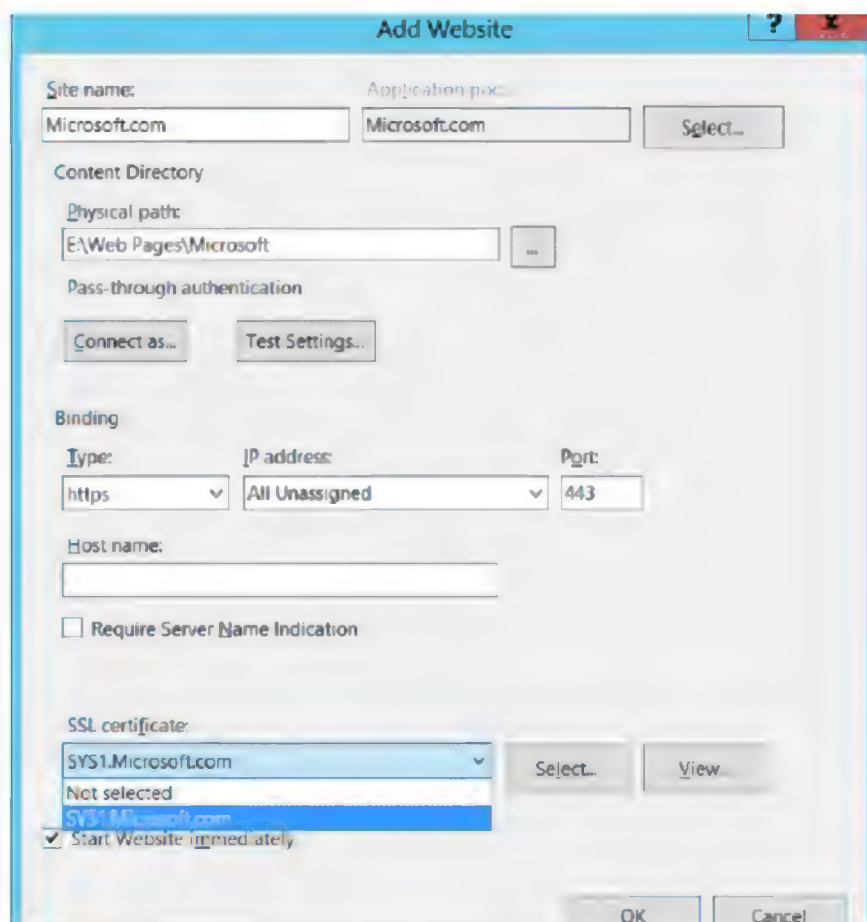


3. **Add Web Site** wizard opens → In the Site name type a **Name** (Ex: **Microsoft.com**) In Physical path, browse and select the location of **Home Directory (Webpage's Folder)**
4. Select the protocol as **HTTPS**





5. Select the SSL Certificate (Ex:SYS1.MICROSOFT.COM).



6. Click **OK**, Web Site will be successfully added.
7. Enable **Directory Browsing**. (Repeat the process of Directory Browsing)
8. Apply **Default Document**. (Repeat the process of Default Document)

## Accessing the HTTPS site from the Web Server

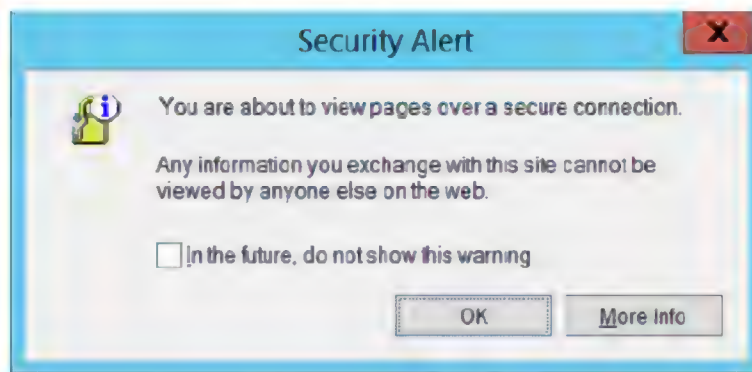
### SYS1 – CONFIGURATION

1. Open the browser and type **https://certificate-name**

Ex: **Https://sys1.microsoft.com**



2. An warning will be given, click OK to proceed



3. Web site is displayed, verify for Yellow Lock beside Address bar.



## Accessing the HTTPS site from the Client Computer

### SYS2 – CONFIGURATION

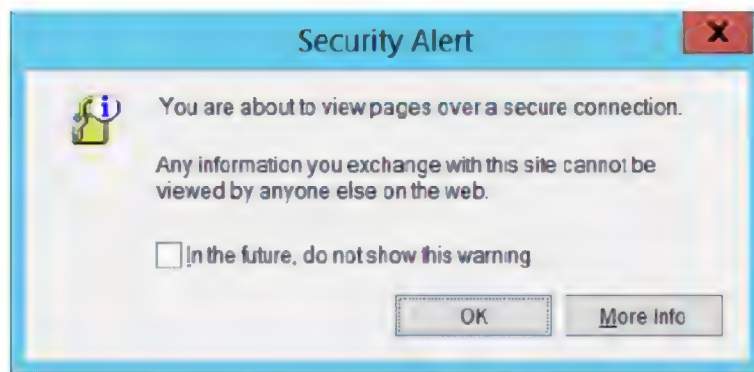
1. Open the browser and type **https://certificate-name**

Ex: **Https://sys1.microsoft.com**

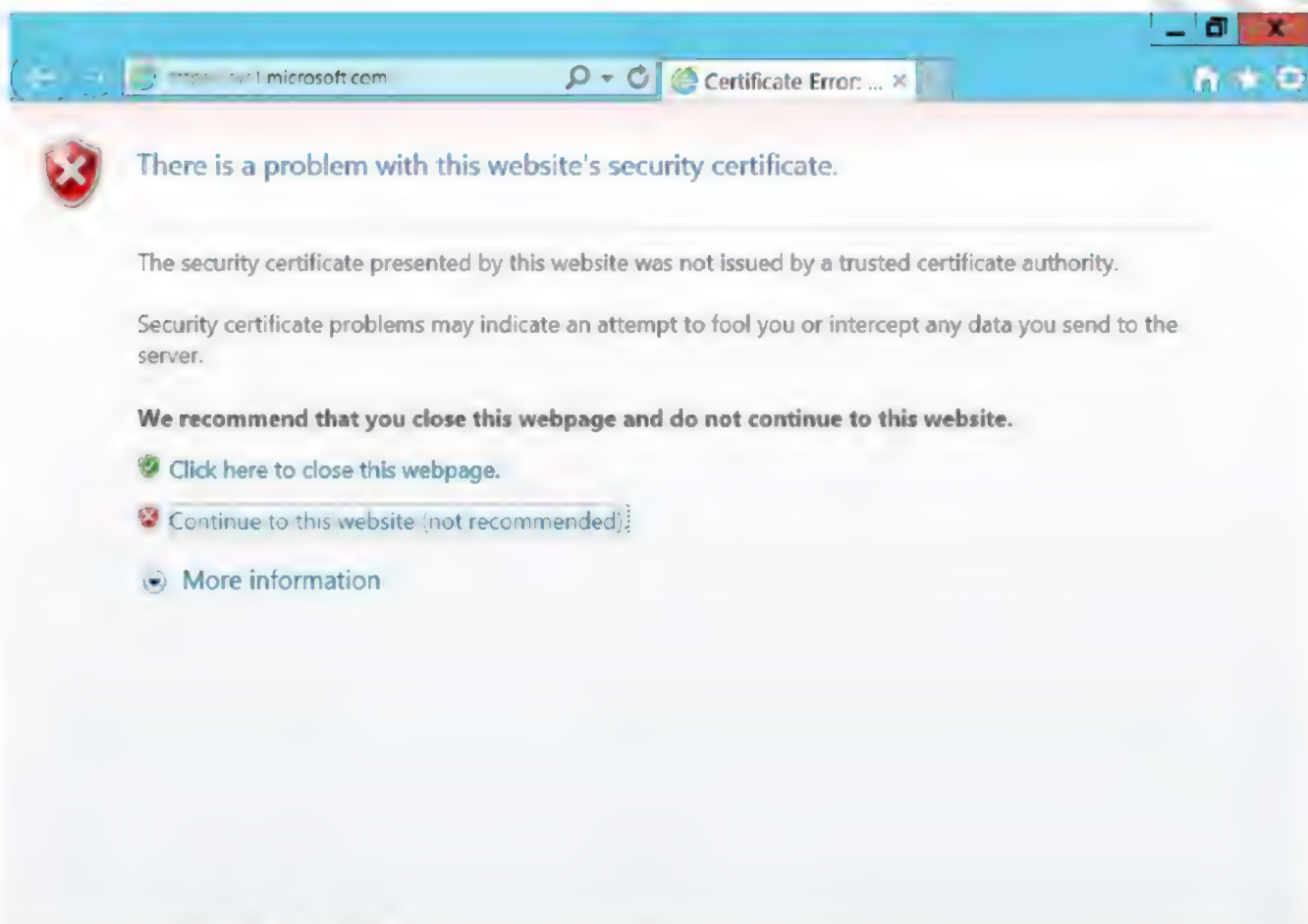




2. An warning will be given, click OK to proceed



3. There is a problem with Website's Security Certificate (The Security Certificate presented by website was not issued by a Trusted Certification Authority), Click on **Continue to this Web site (Not Recommended)**



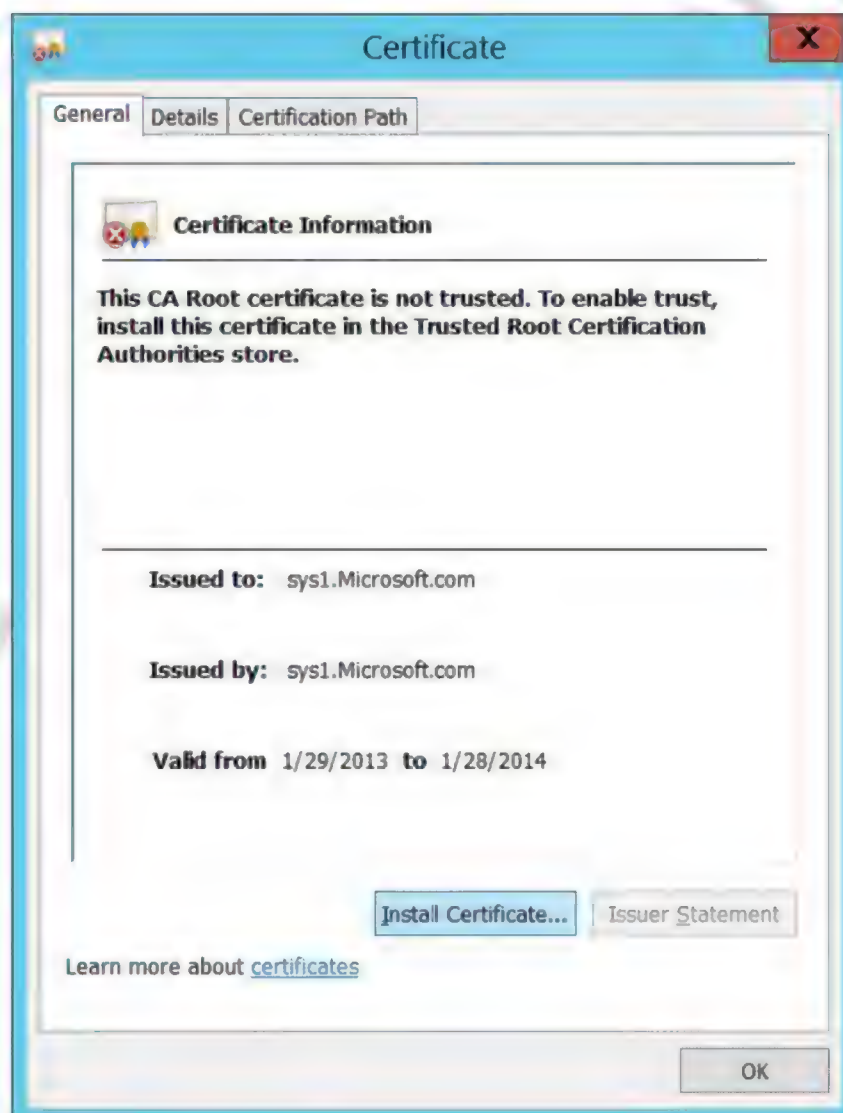
4. Web site is displayed but there is a **Certificate Error**



5. Click on **Certificate Error** and Click on **View Certificates**

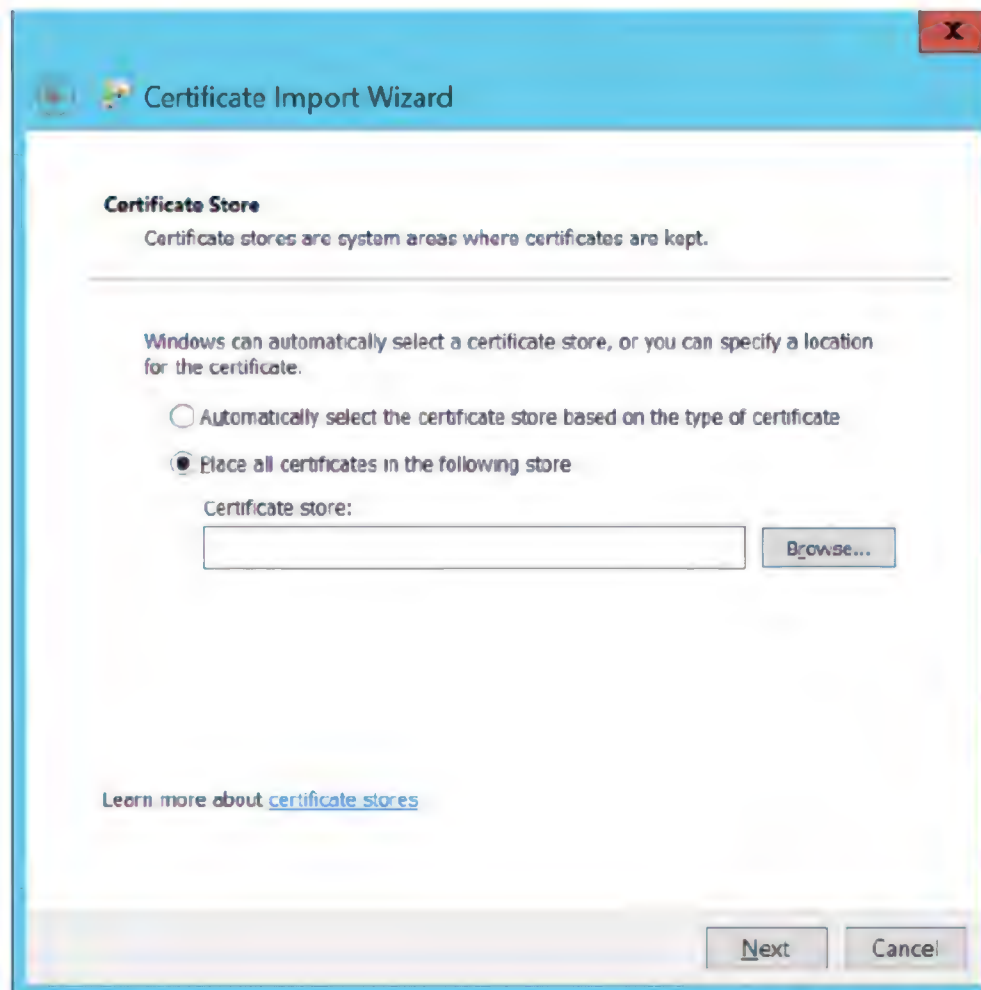


6. Click on **Install Certificate**

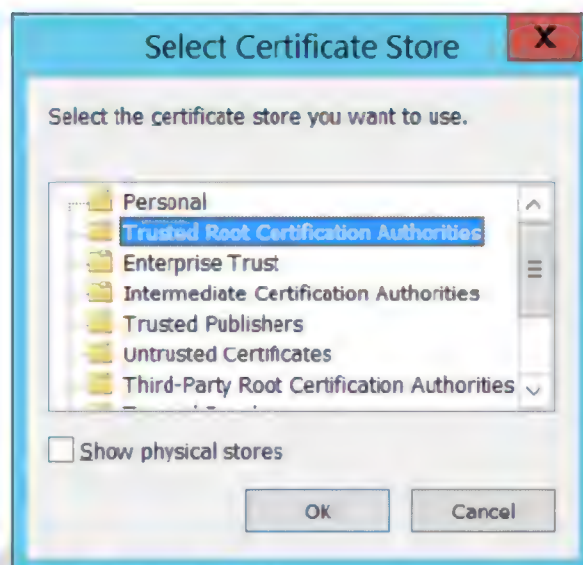


7. Click Next

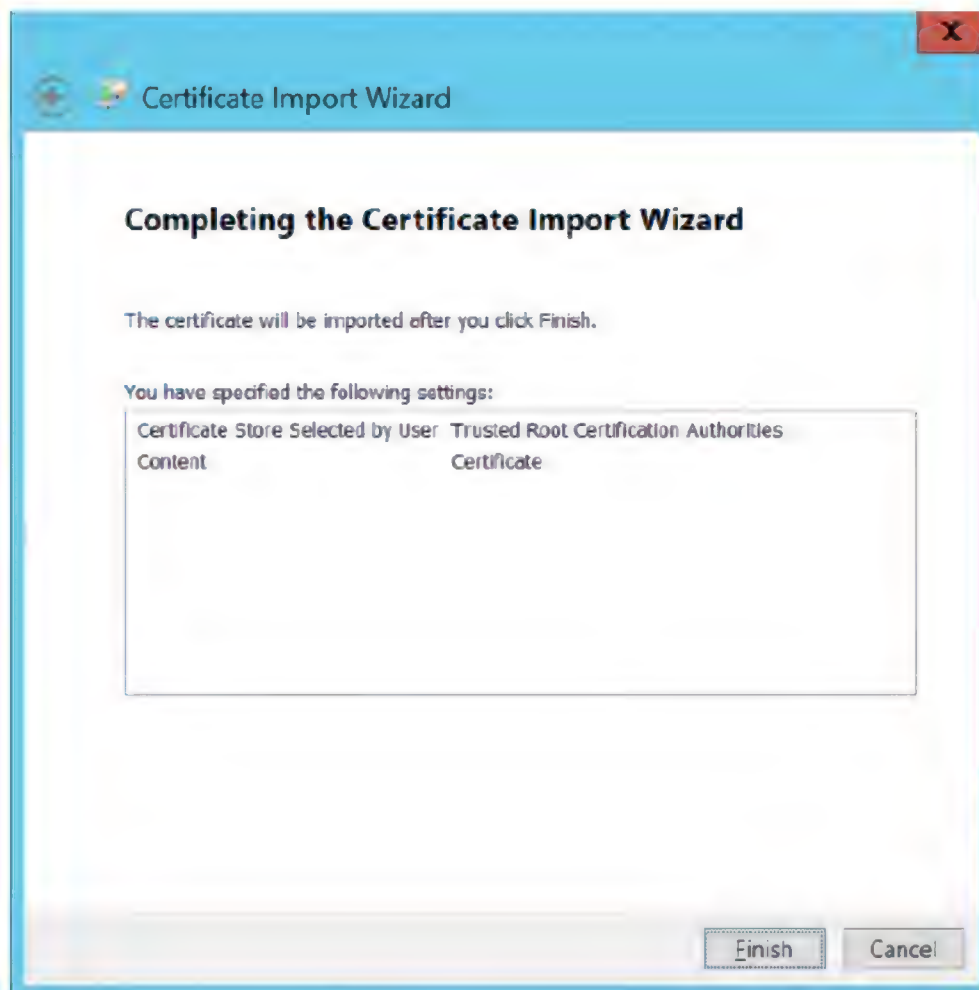
8. Select **Place all certificates in the following store** → Click **Browse**.



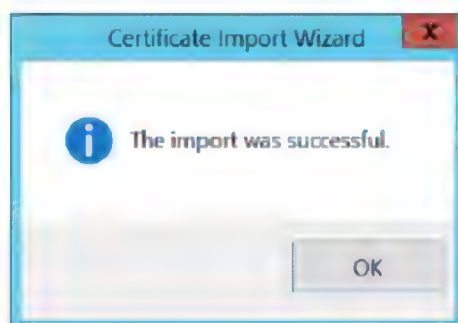
9. Select **Trusted Root Certification Authority** → Click **OK** → Click **Next**



10. Click **Finish**



11. Click **Yes**→ Click **OK**→Click **OK**.





12. Web site is displayed, Click on the Yellow Lock beside Address bar, to see the website security status



## Lab – 77: Installing and configuring iSCSI target server

### Objective:

To provide storage to Remote Servers.

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A member server running windows server 2012 or client running windows 7.

### Topology:



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#### SYS1

##### Domain Controller / iscsi target server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

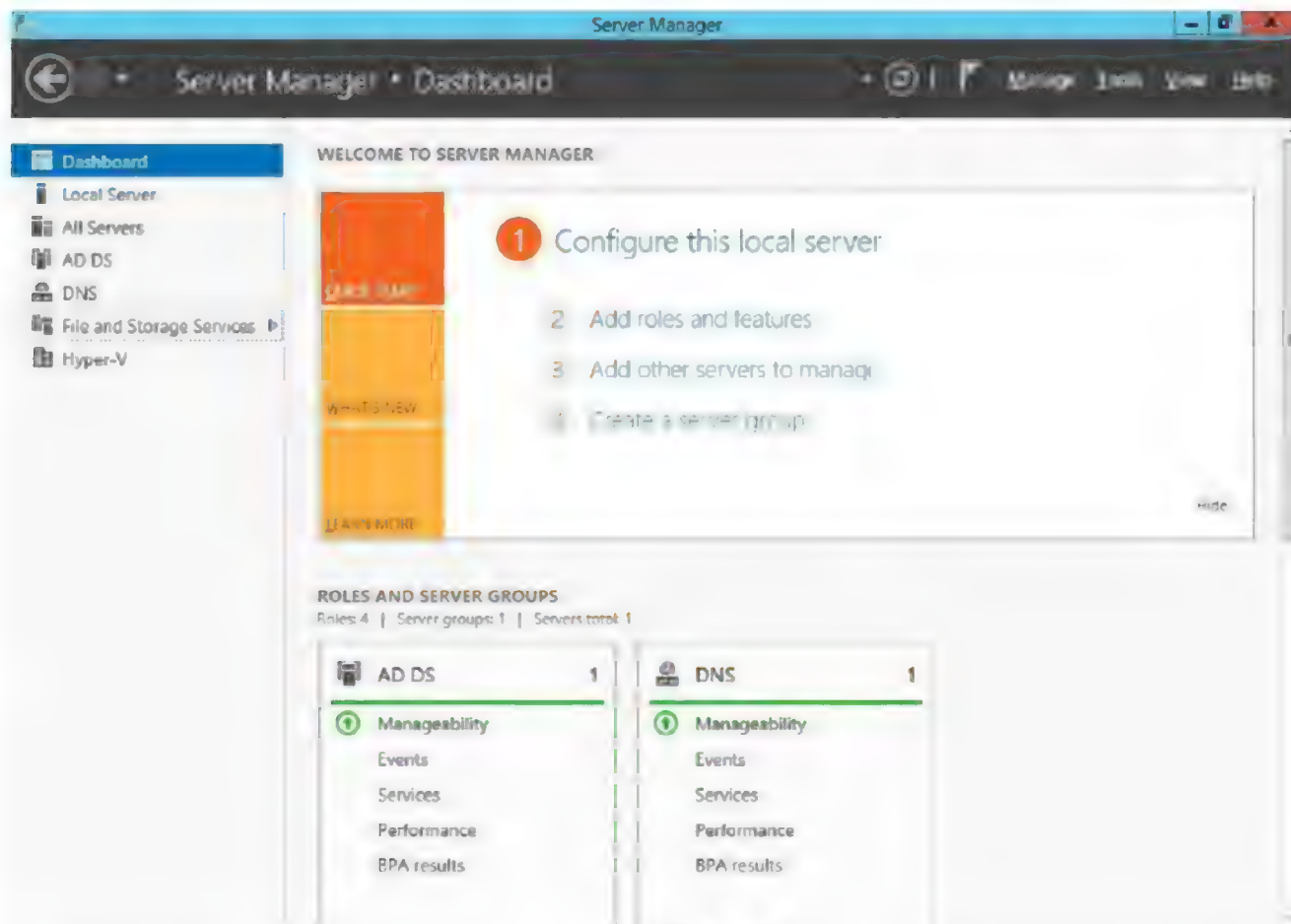
##### Member Server / Client (iscsi initiators)

IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

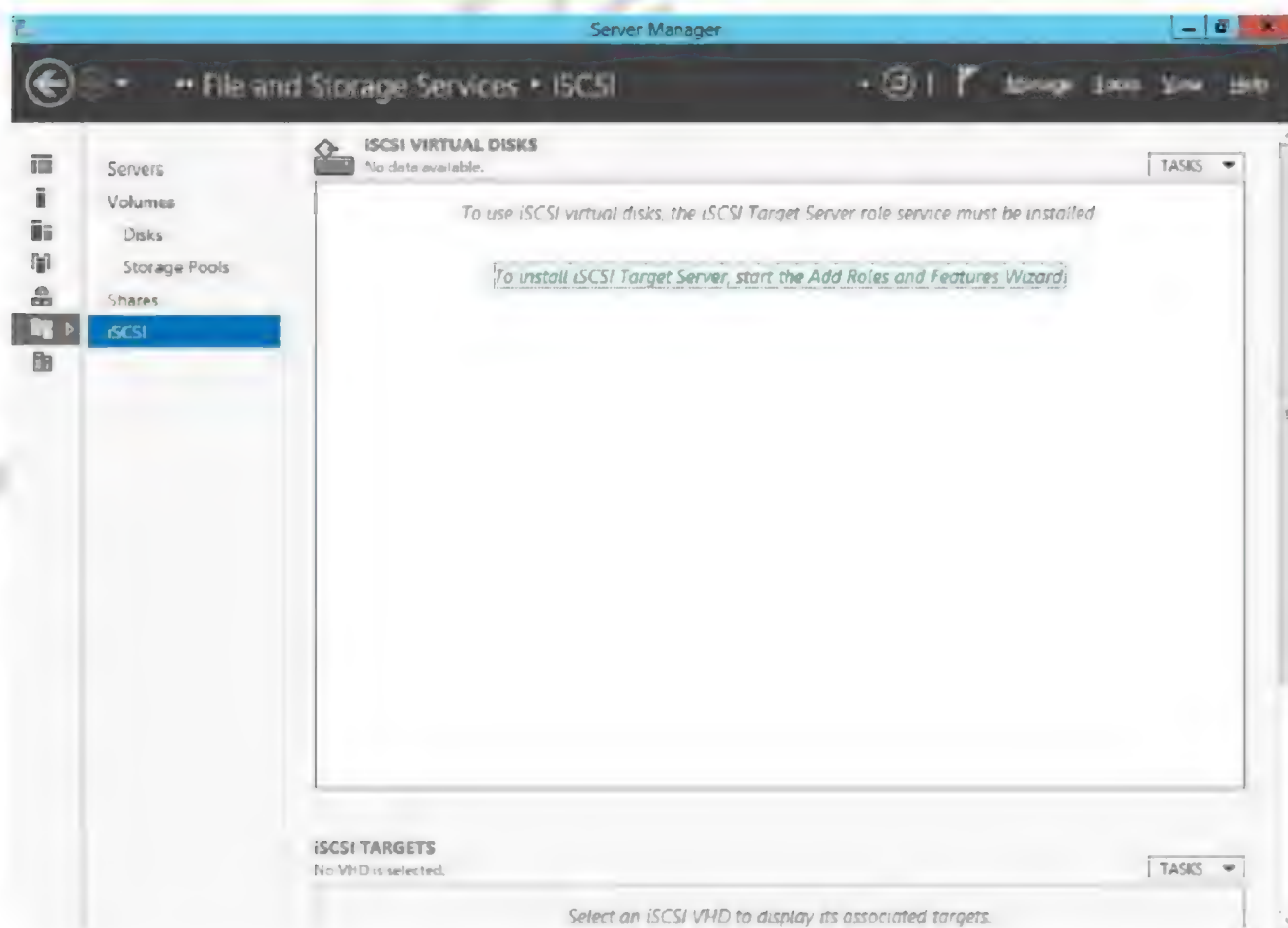
## Configuring iSCSI Target Server

### SYS1 – CONFIGURATION

1. Go to Server Manager, click **File and Storage Services**.

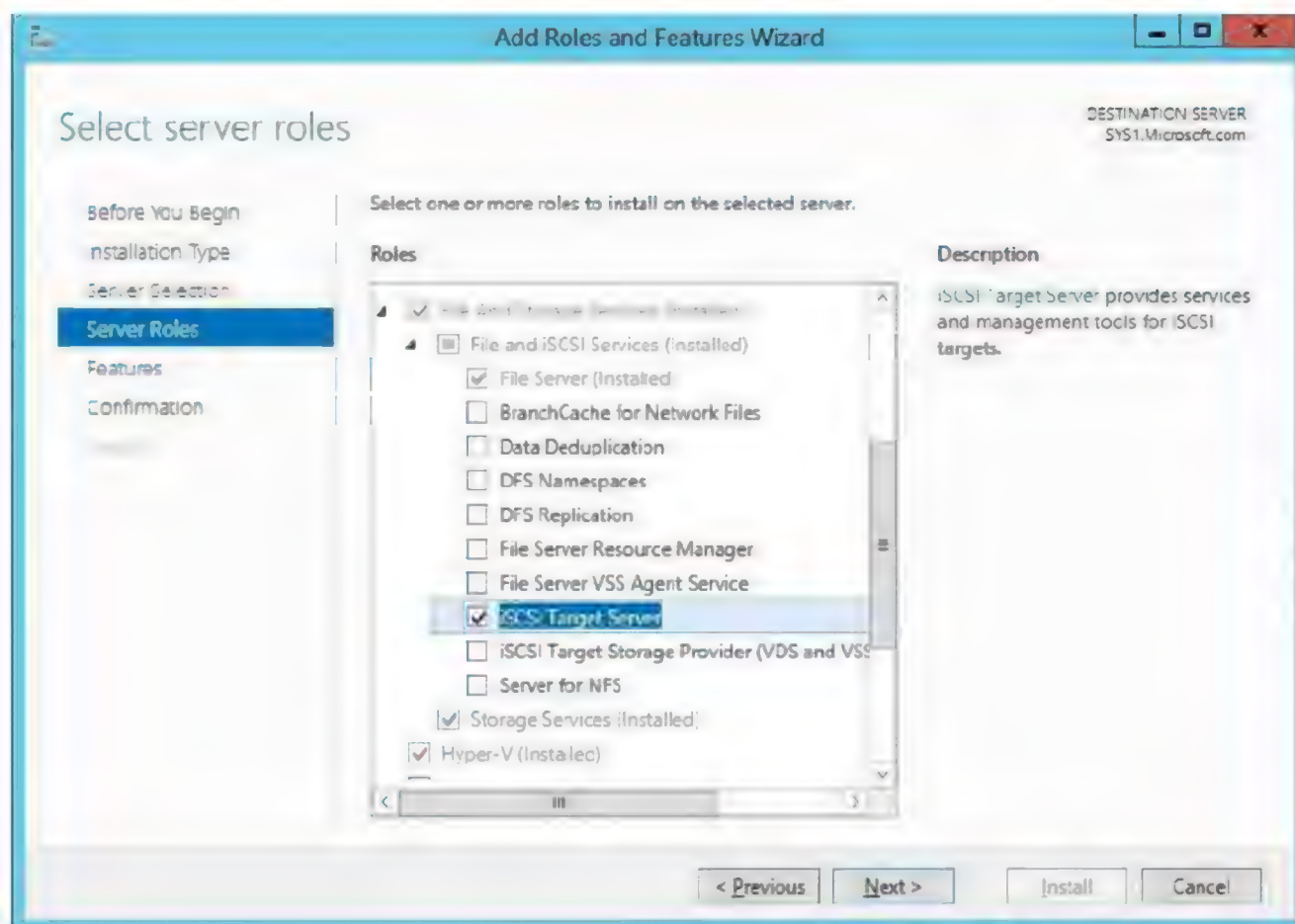


2. Click **To install iSCSI Target Server**, start the **Add roles and Features Wizard**.

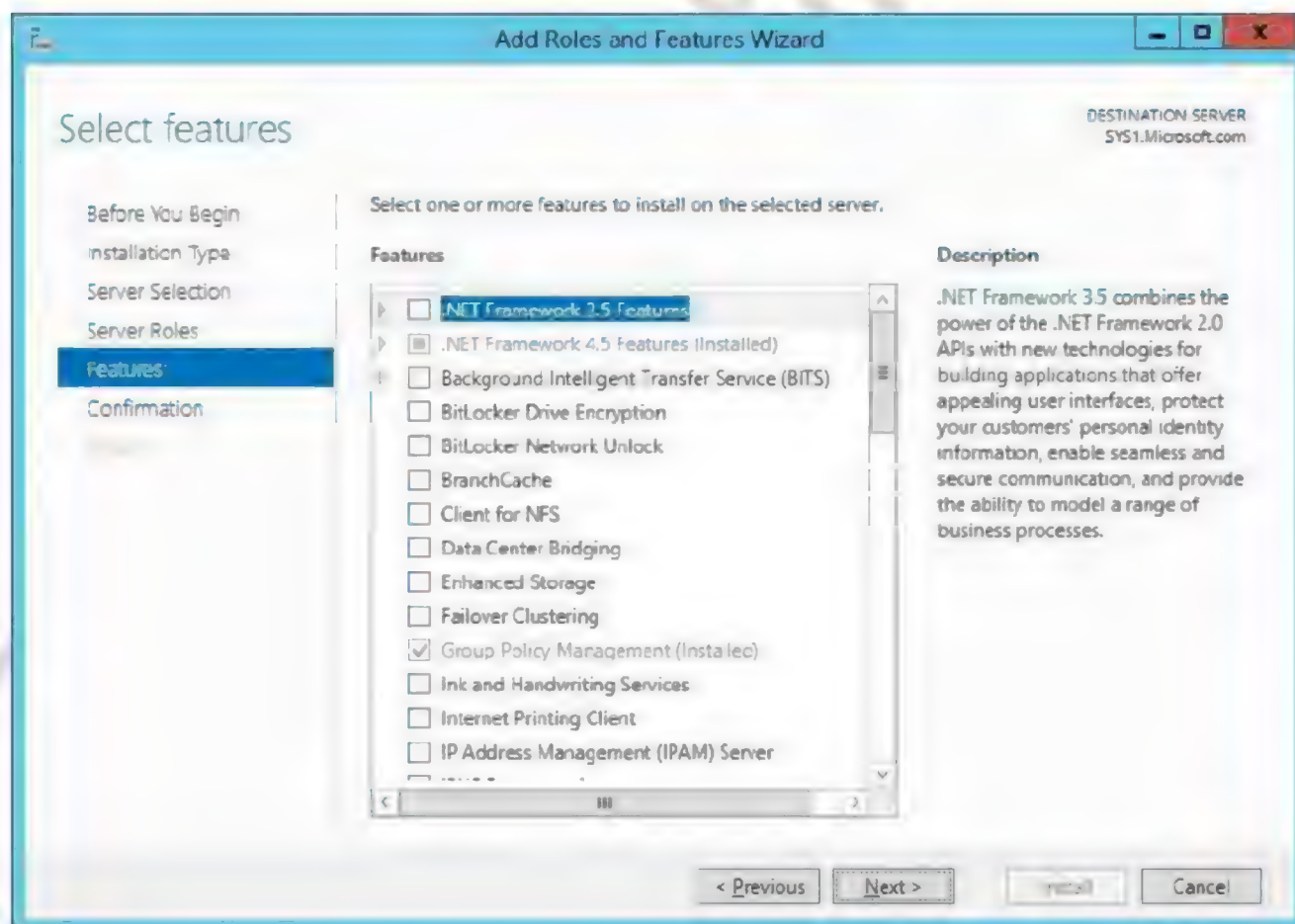




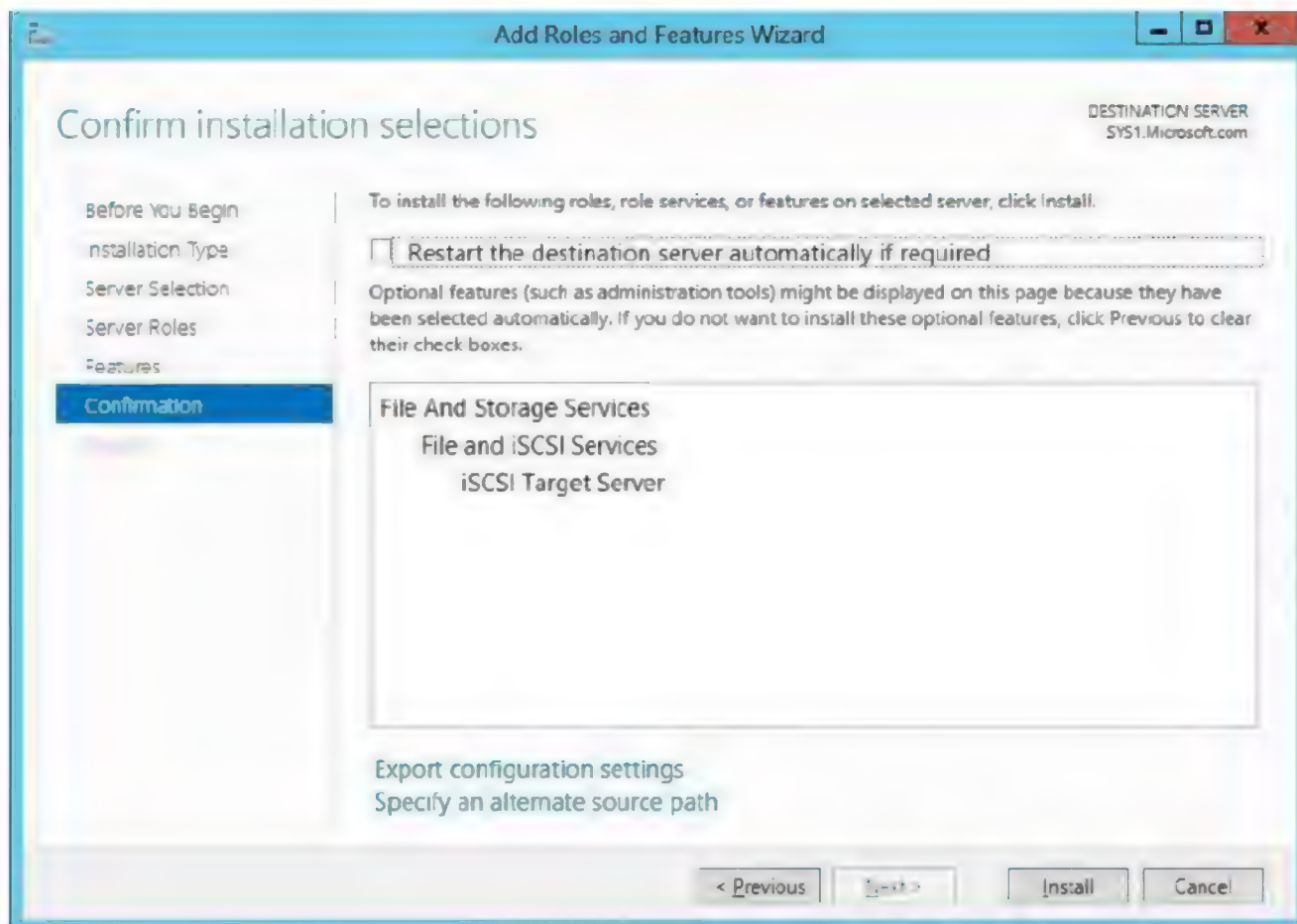
3. In Select server roles page, check the box iSCSI Target Server, click **Next**.



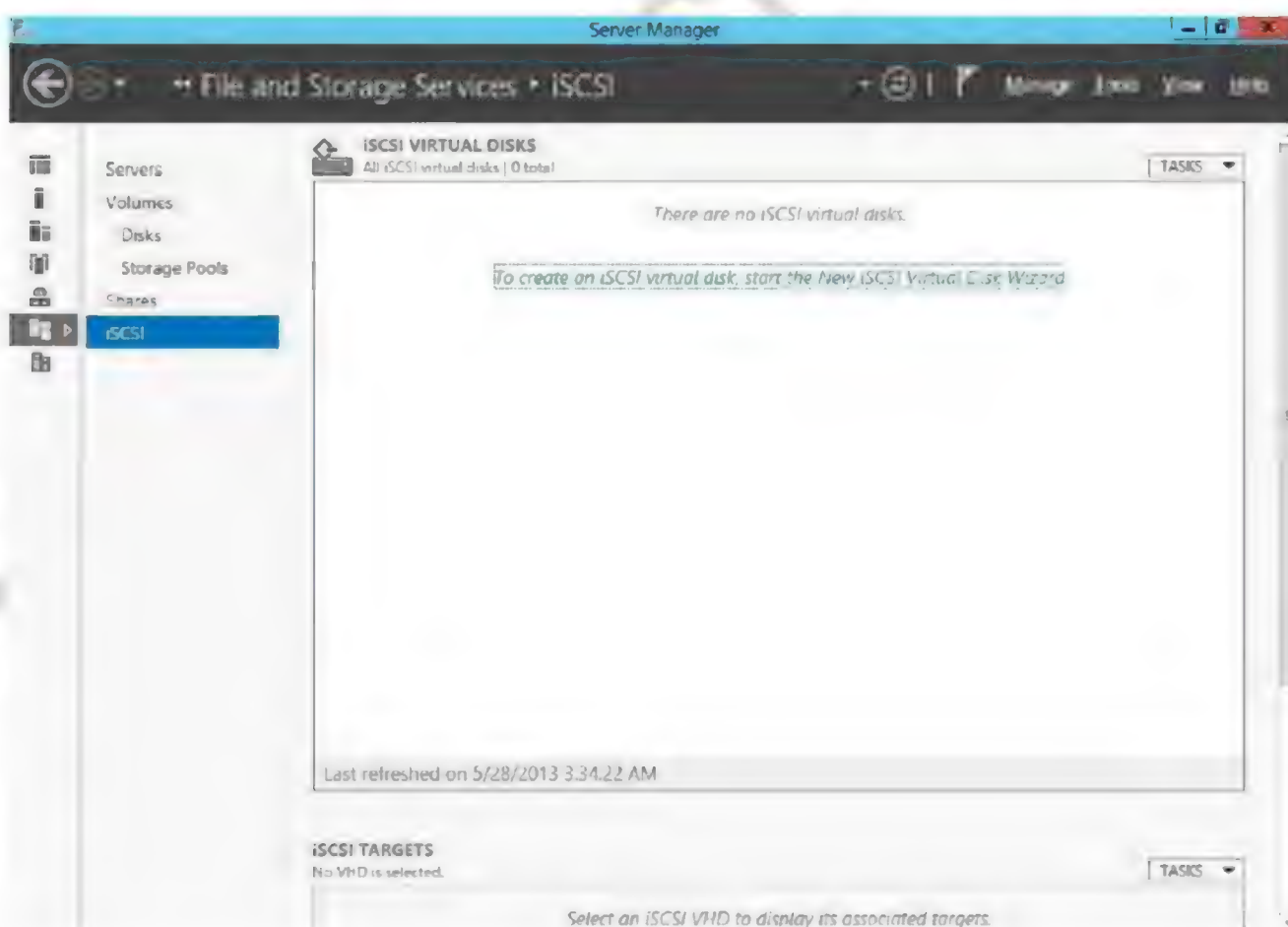
4. In Select features page, click **Next**.



5. Check box Restart the destination server automatically if required, click **Install**.



6. Go to Server Manager, select File and Storage Services, and select iSCSI, click **To create an iSCSI virtual disk**, start the New iSCSI Virtual Disk Wizard.



7. Enter **Name** (Ex: Vdisk1), click **Next**.

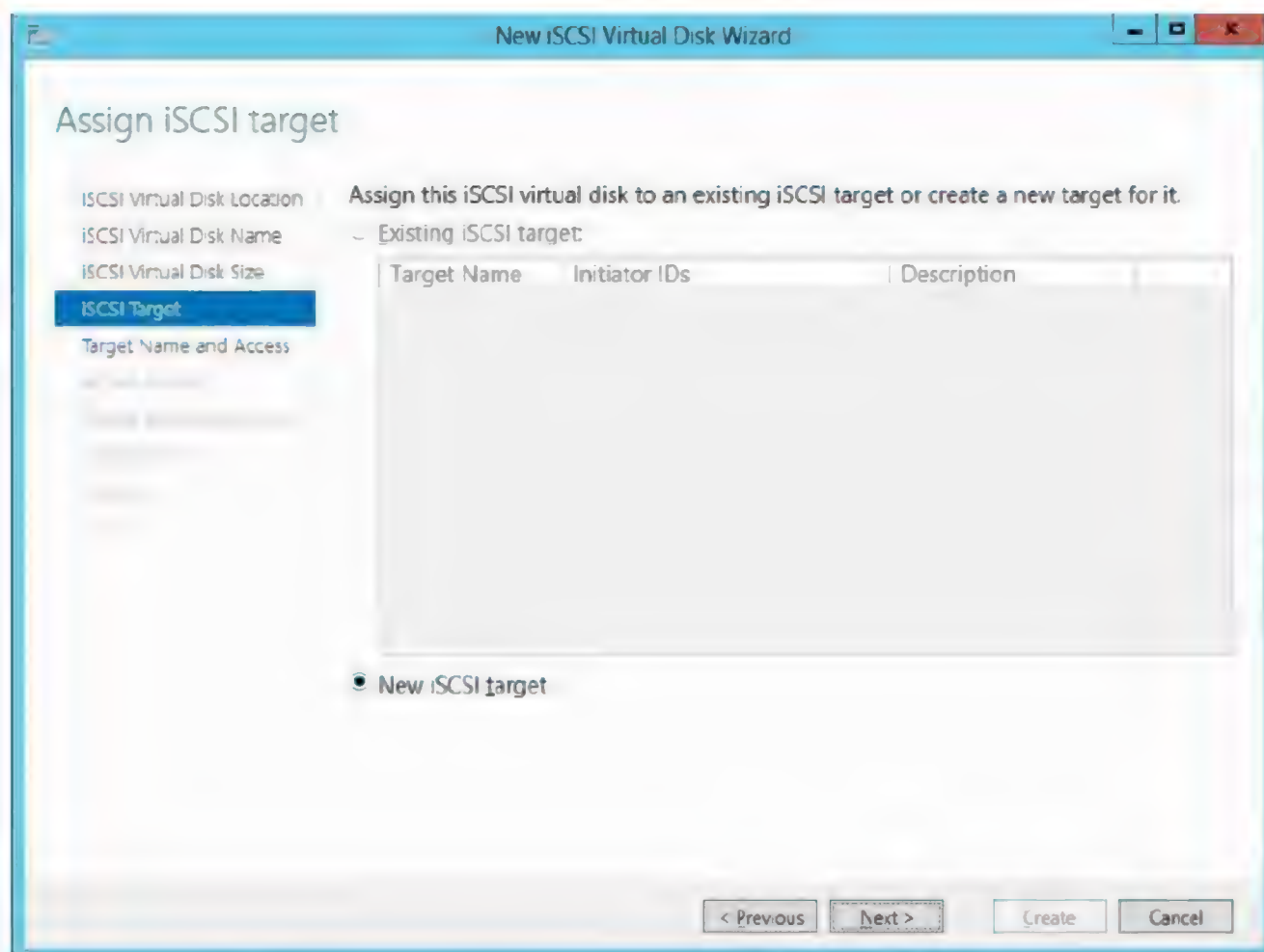
The screenshot shows the 'New iSCSI Virtual Disk Wizard' window. The title bar reads 'New iSCSI Virtual Disk Wizard'. The main heading is 'Specify iSCSI virtual disk name'. On the left, there is a list of steps: 'iSCSI Virtual Disk Location', 'iSCSI Virtual Disk Name' (which is highlighted with a blue bar), and 'iSCSI Virtual Disk Size'. The 'Name' field is set to 'Vdisk1'. The 'Description' field is empty. The 'Path' field is set to 'E:\iSCSIVirtualDisks\Vdisk1.vhd'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Create', and 'Cancel'.

8. Enter the iSCSI virtual disk size (Ex: 4 GB), click **Next**.

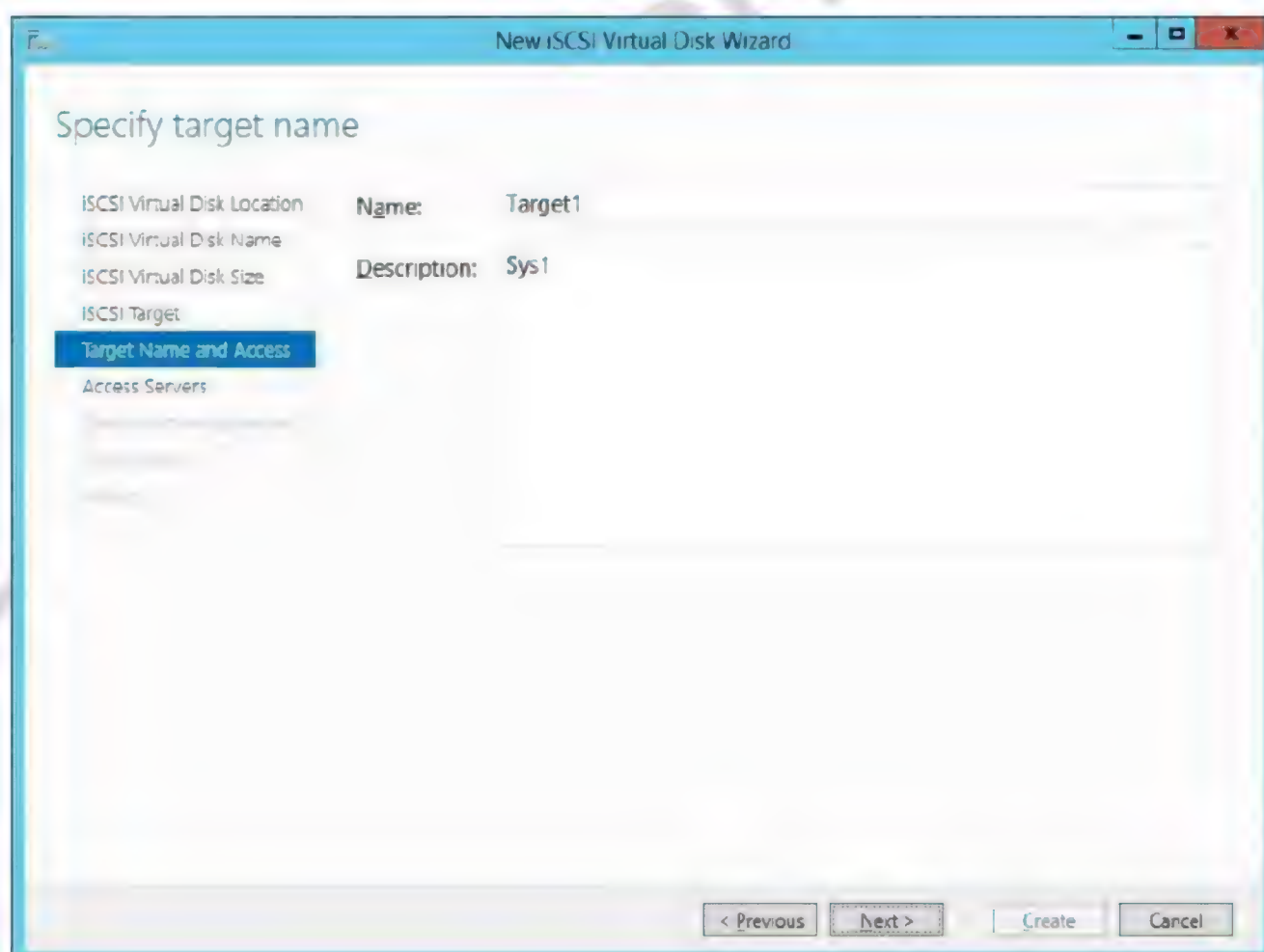
The screenshot shows the 'New iSCSI Virtual Disk Wizard' window. The title bar reads 'New iSCSI Virtual Disk Wizard'. The main heading is 'Specify iSCSI virtual disk size'. On the left, there is a list of steps: 'iSCSI Virtual Disk Location', 'iSCSI Virtual Disk Name', 'iSCSI Virtual Disk Size' (which is highlighted with a blue bar), and 'iSCSI Target'. The 'Free space' is shown as '18.4 GB'. The 'Size' field is set to '4' with a dropdown menu showing 'GB'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Create', and 'Cancel'.



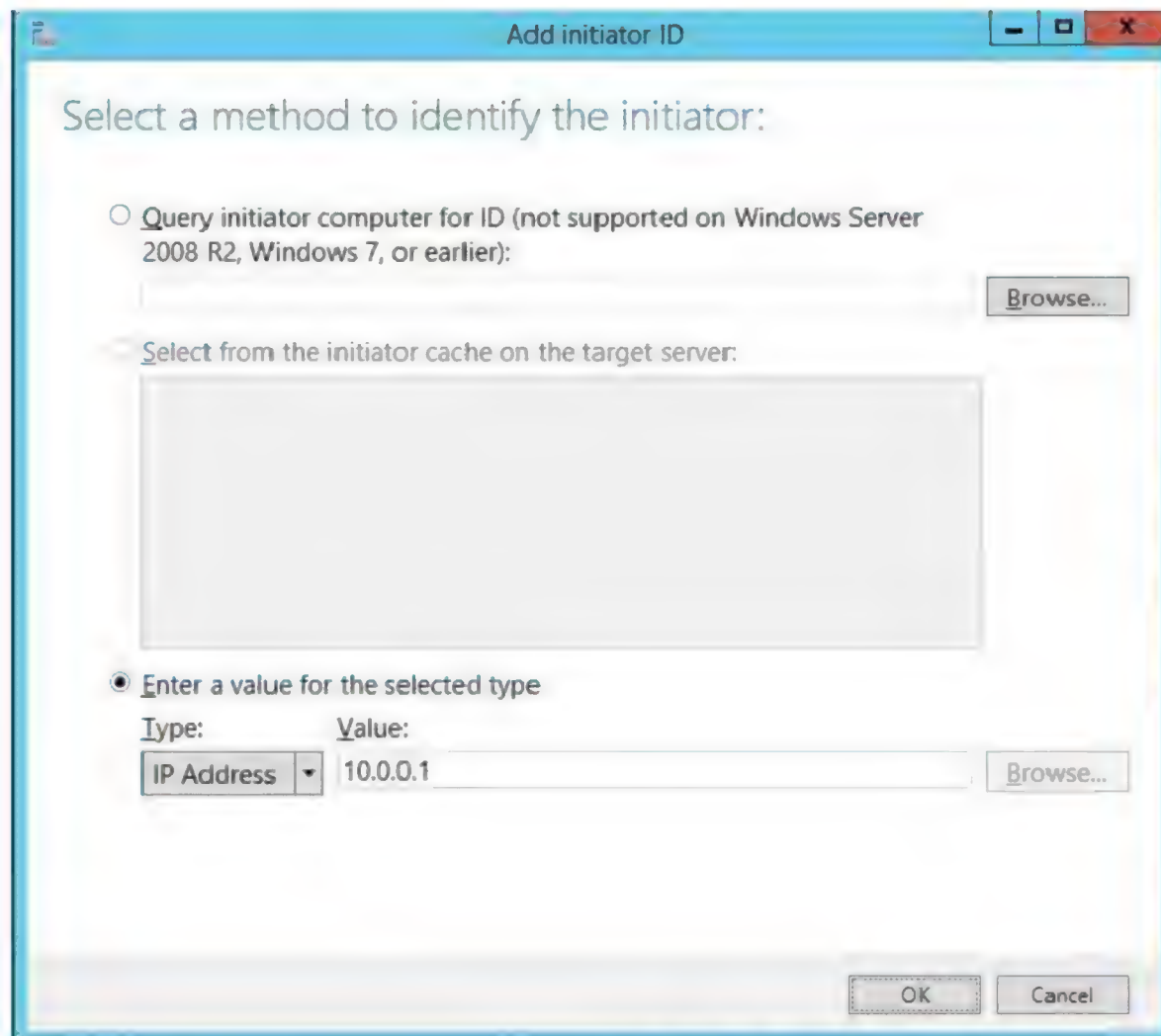
9. Select New iSCSI target, click **Next**.



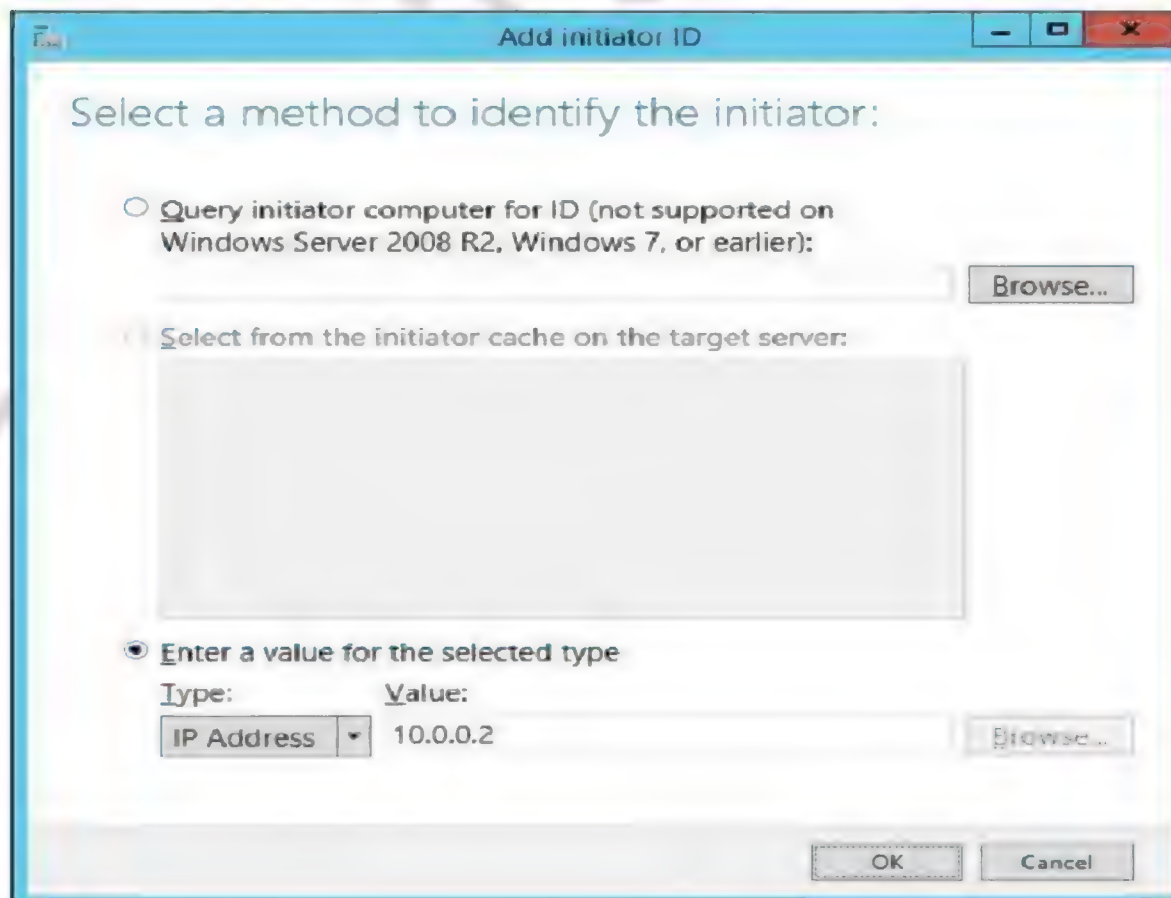
10. Enter the **Name** (Ex: Target1), click **Next**.



11. Select Enter a value for the selected type, select **IP Address** in Type, enter the Value (Ex: 10.0.0.1), click **OK**.



12. To allow other computers to access the iSCSI Target Server, Select Enter a value for the selected type, select **IP Address** in Type, enter the Value (Ex: 10.0.0.1), click **OK**.



13. Only the specified servers can access the iSCSI Target Server, click **Next**.

The screenshot shows the 'Specify access servers' step of the 'New iSCSI Virtual Disk Wizard'. The left sidebar contains a list of steps: 'iSCSI Virtual Disk Location', 'iSCSI Virtual Disk Name', 'iSCSI Virtual Disk Size', 'iSCSI Target', 'Target Name and Access', 'Access Servers' (highlighted), and 'Enable authentication ser...'. The main area has a title 'Specify access servers' and a description: 'Click Add to specify the iSCSI initiator(s) that will access this iSCSI virtual disk.' Below this is a table with two columns: 'Type' and 'Value'. The table contains two entries: 'IPAddress' with value '10.0.0.1' and 'IPAddress' with value '10.0.0.2'. At the bottom of the table are 'Add...' and 'Remove' buttons. Below the table is a link 'Learn more about access servers'. At the bottom of the wizard are buttons for '< Previous', 'Next >', 'Create', and 'Cancel'.

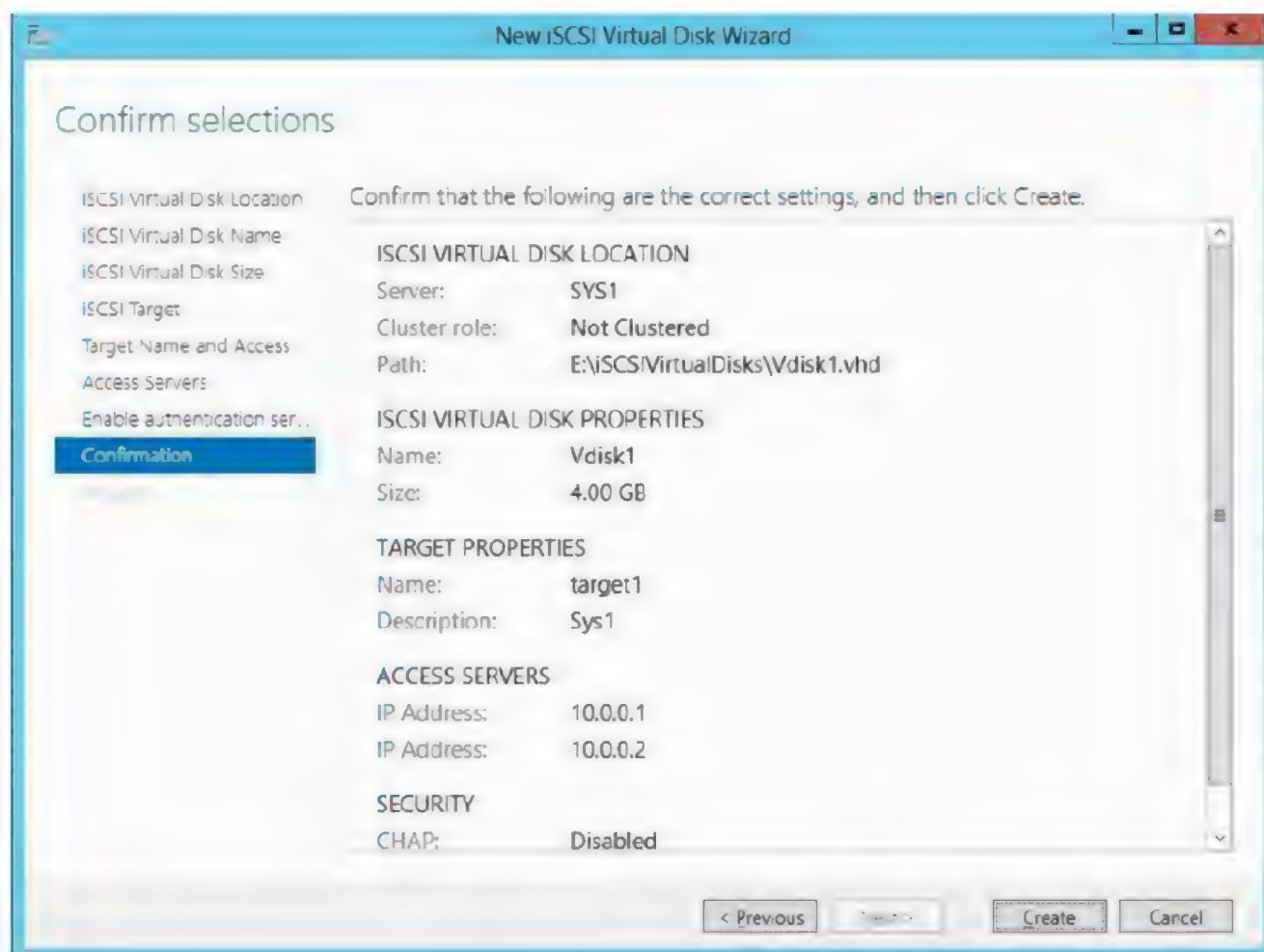
Type	Value
IPAddress	10.0.0.1
IPAddress	10.0.0.2

14. In Enable Authentication page, click **Next**.

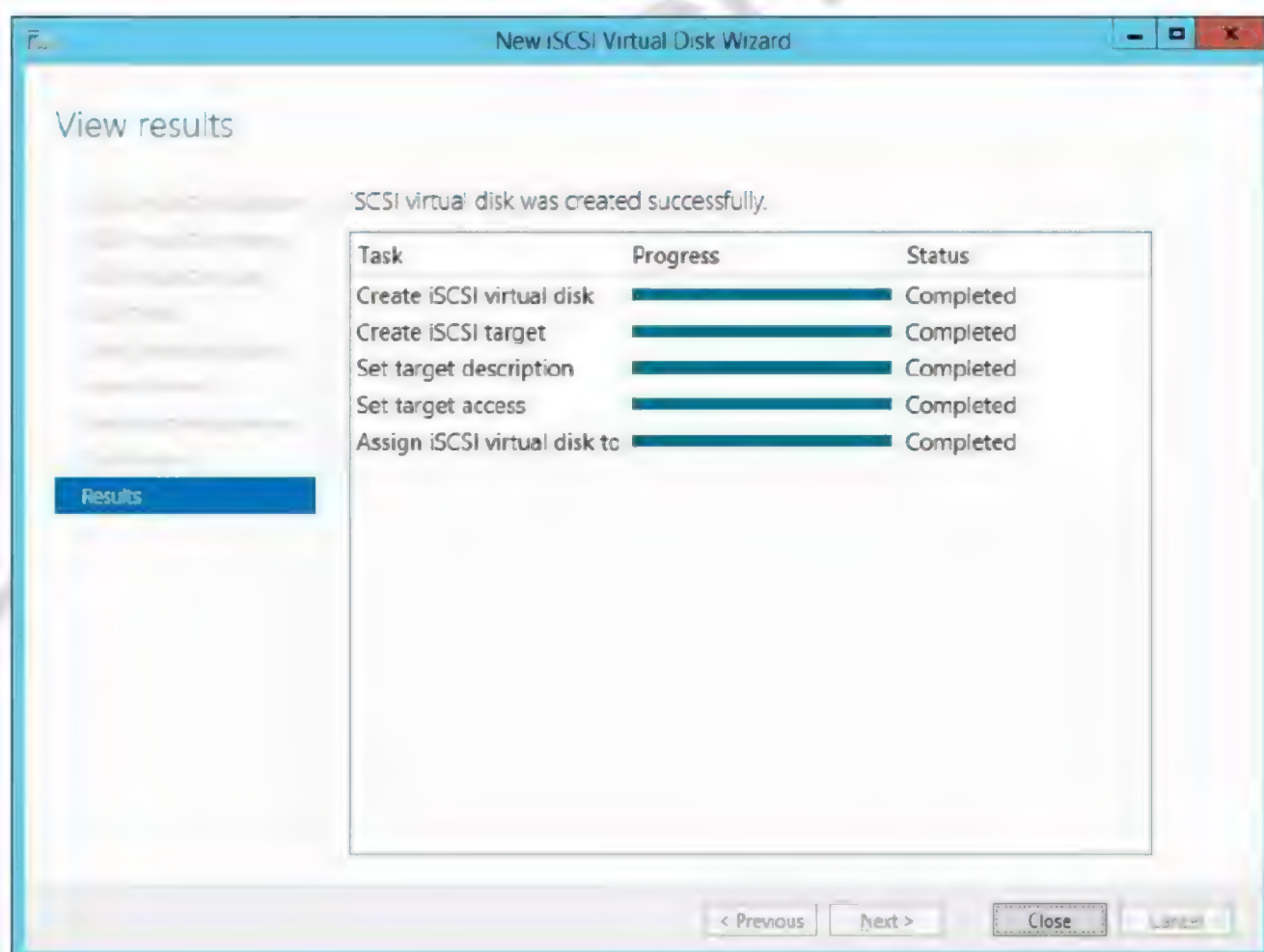
The screenshot shows the 'Enable Authentication' step of the 'New iSCSI Virtual Disk Wizard'. The left sidebar contains a list of steps: 'iSCSI Virtual Disk Location', 'iSCSI Virtual Disk Name', 'iSCSI Virtual Disk Size', 'iSCSI Target', 'Target Name and Access', 'Access Servers', 'Enable authentication ser...' (highlighted), and 'Confirmation'. The main area has a title 'Enable Authentication' and a description: 'Optionally, enable the CHAP protocol to authenticate initiator connections, or enable reverse CHAP to allow the initiator to authenticate the iSCSI target.' Below this are two sections. The first section is 'Enable CHAP:' with a checkbox and three text boxes: 'User name:', 'Password:', and 'Confirm password:'. The second section is 'Enable reverse CHAP:' with a checkbox and three text boxes: 'User name:', 'Password:', and 'Confirm password:'. At the bottom of the wizard are buttons for '< Previous', 'Next >', 'Create', and 'Cancel'.



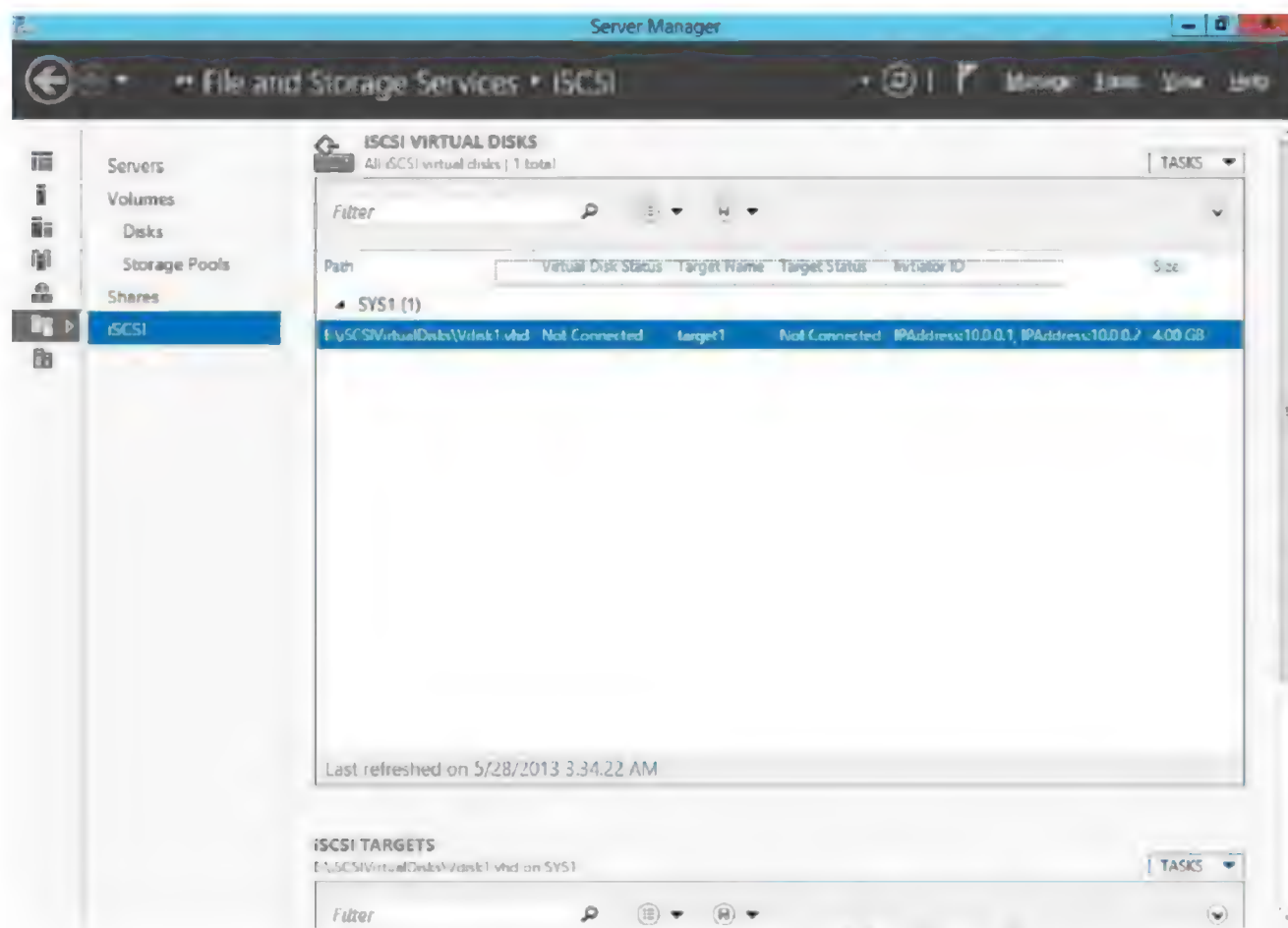
15. Click **Create**.



16. Verify the message Completed, click **Close**.



17. iSCSI Virtual Disk Vdisk1.vhd has been created.

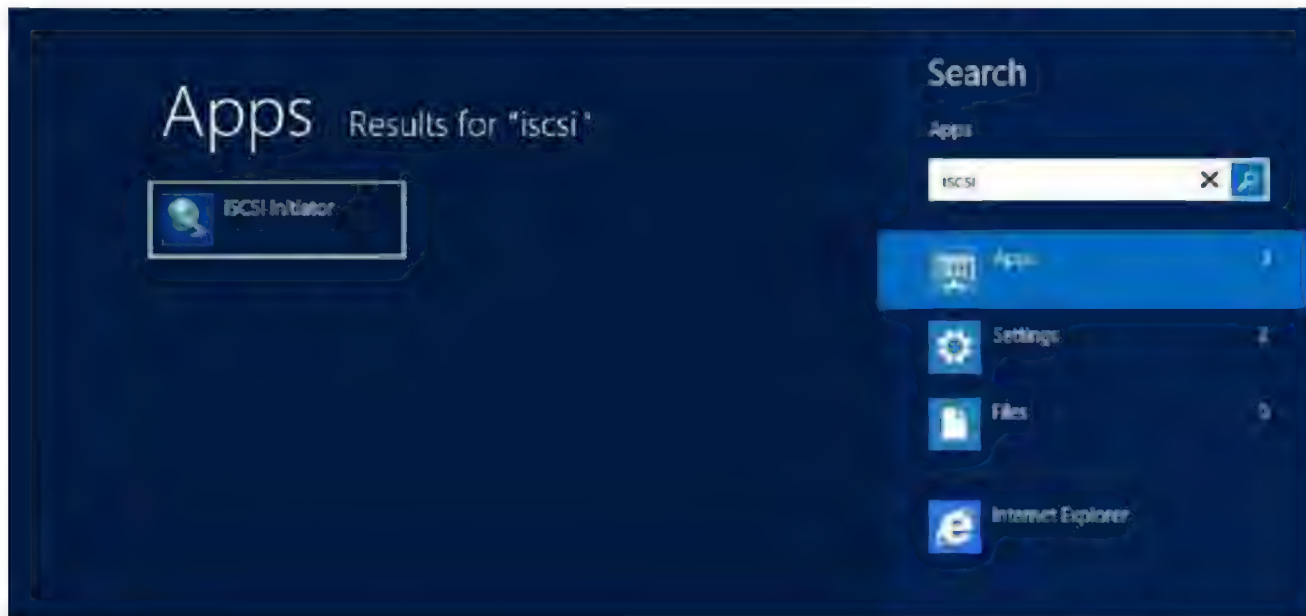


18. Similarly create multiple iSCSI Virtual Disk that can be accessed from **SYS2**.

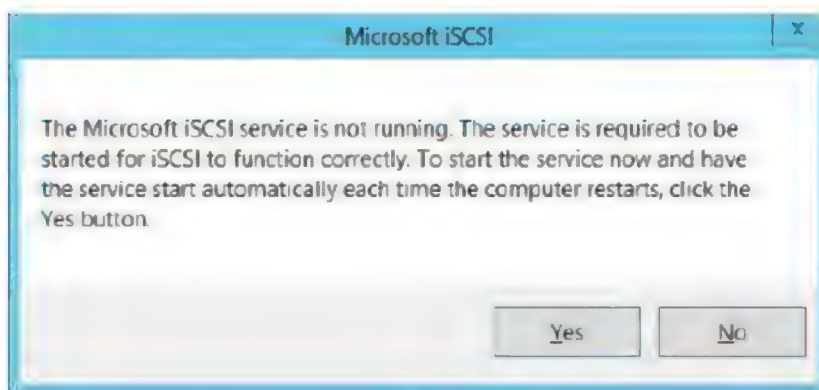
## Configuring iSCSI Initiator

### SYS2 – CONFIGURATION

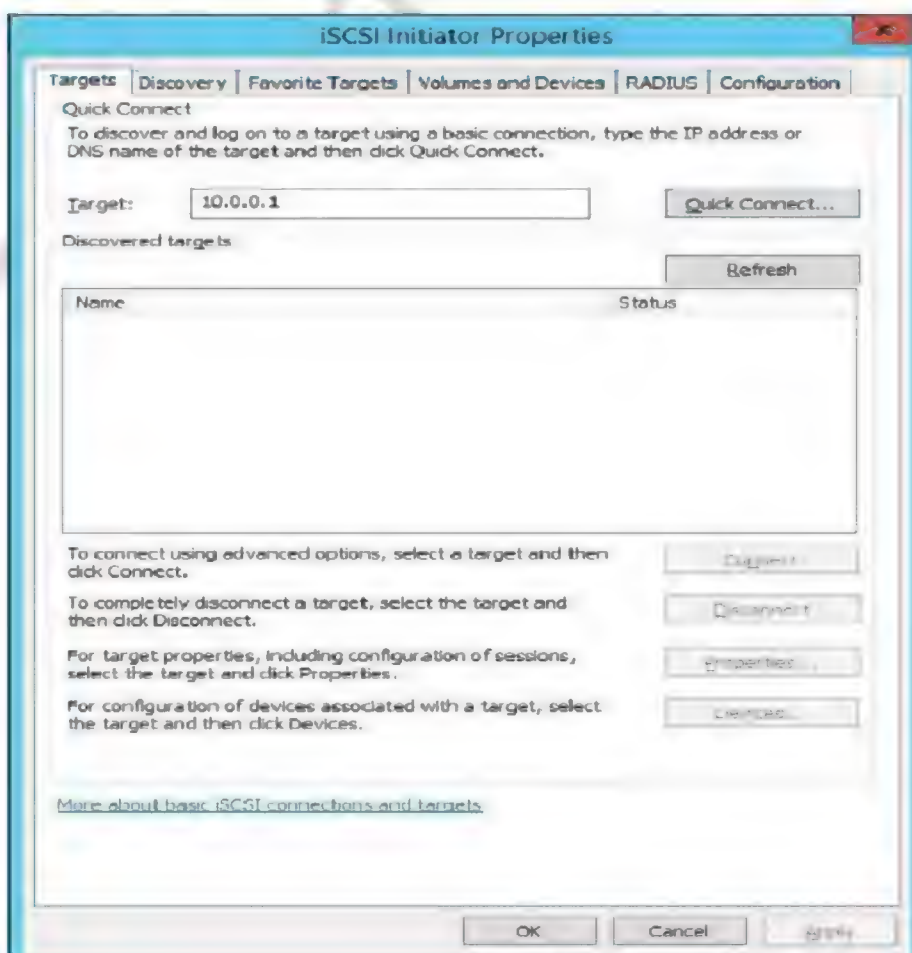
1. Go to Start, type iSCSI in Search Apps, select **iSCSI Initiator**.



2. Click **Yes** to Microsoft iSCSI service.

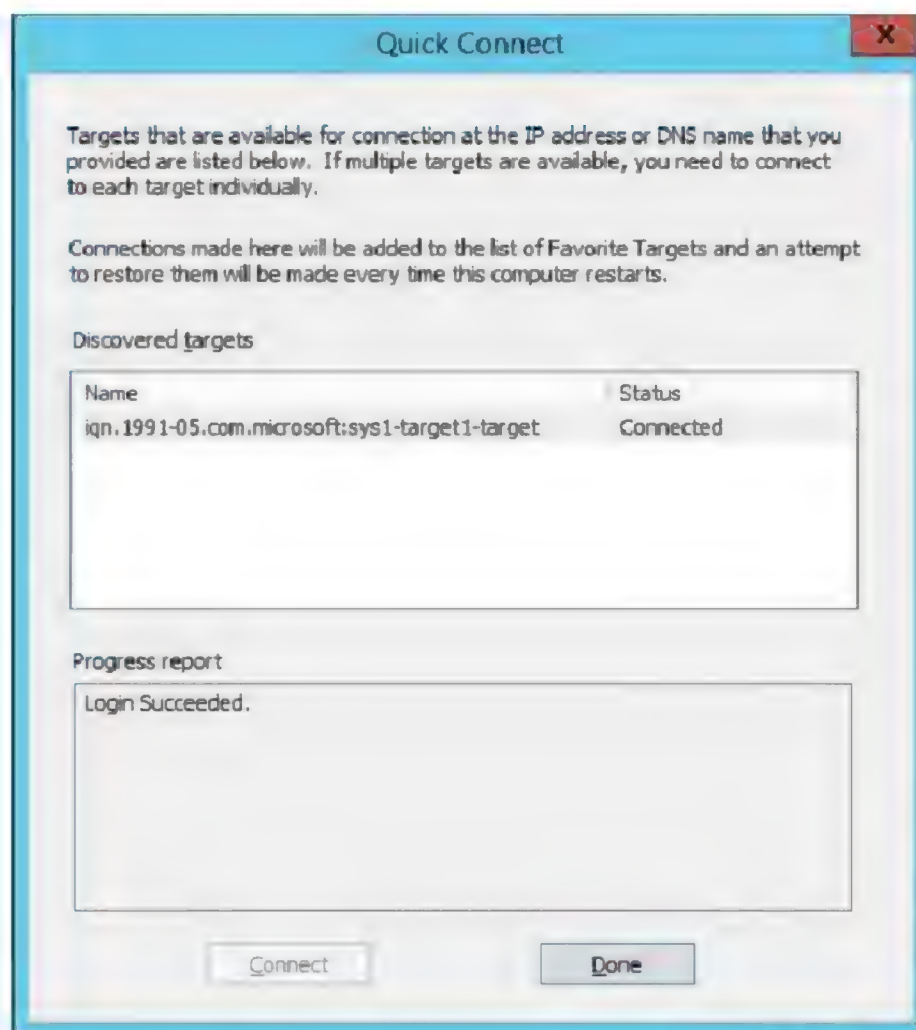


3. Enter the IP Address of Target Server (Ex: 10.0.0.1), click **Quick Connect**.

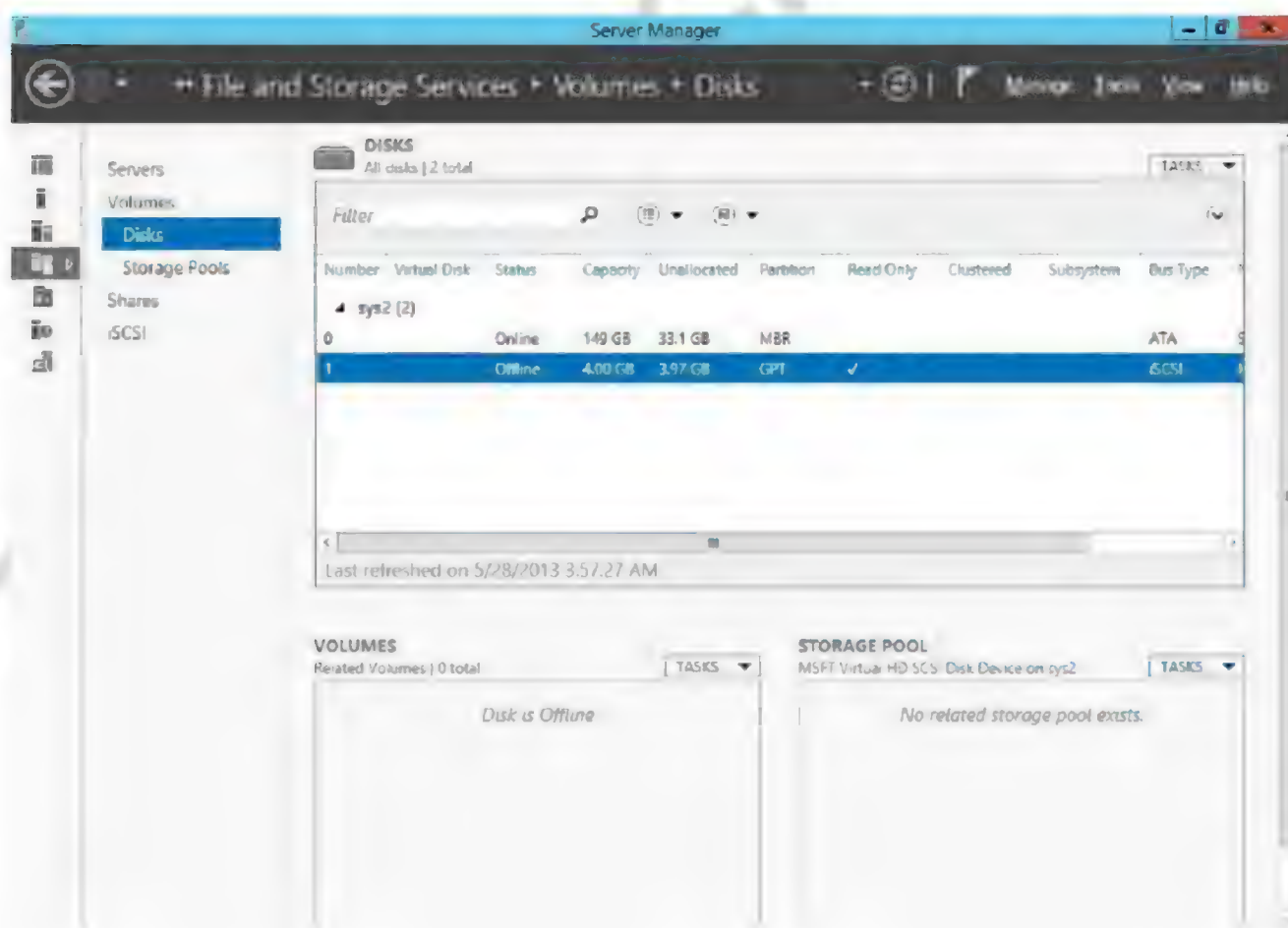




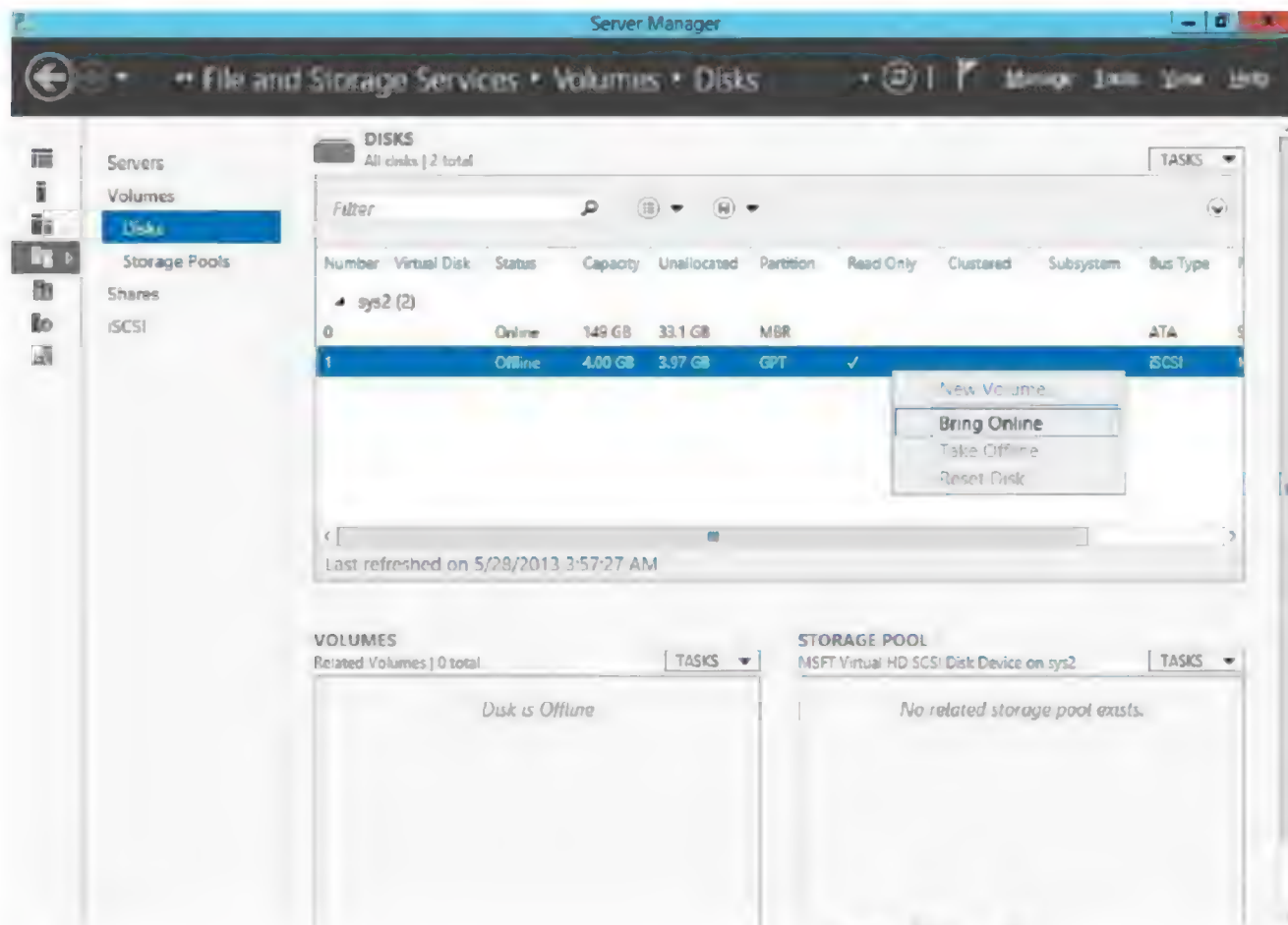
4. Verify for the message Connected, Login Succeeded, click **Done**.



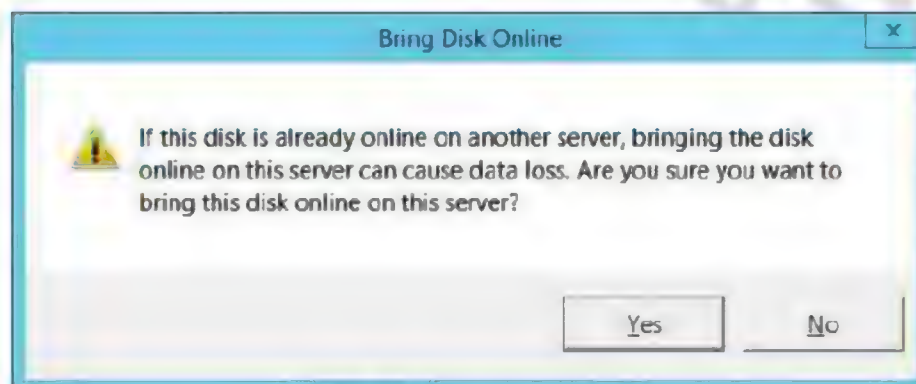
5. Go to Server Manager → File and Storage Services → Disks.



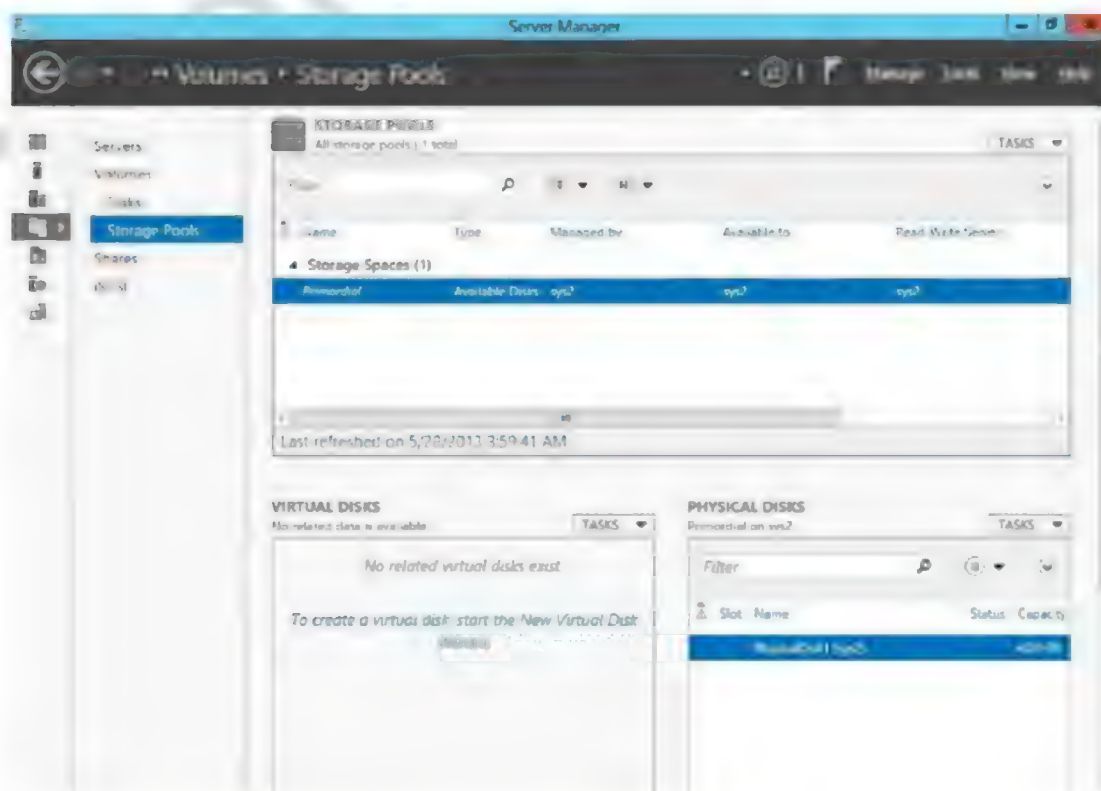
6. Right click on offline disk iSCSI, select **Bring Online**.



7. Click **Yes**



8. Select **Storage Pools**, and Verify for Physical Disk1



## Lab – 78: Creating Storage Pool and Simple Volume

### Objective:

To combine multiple hard disks into a single pool.

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address 10.0.0.1  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.1

#### SYS2

##### Member Server / Client

IP Address 10.0.0.2  
Subnet Mask 255.0.0.0  
Preferred DNS 10.0.0.1

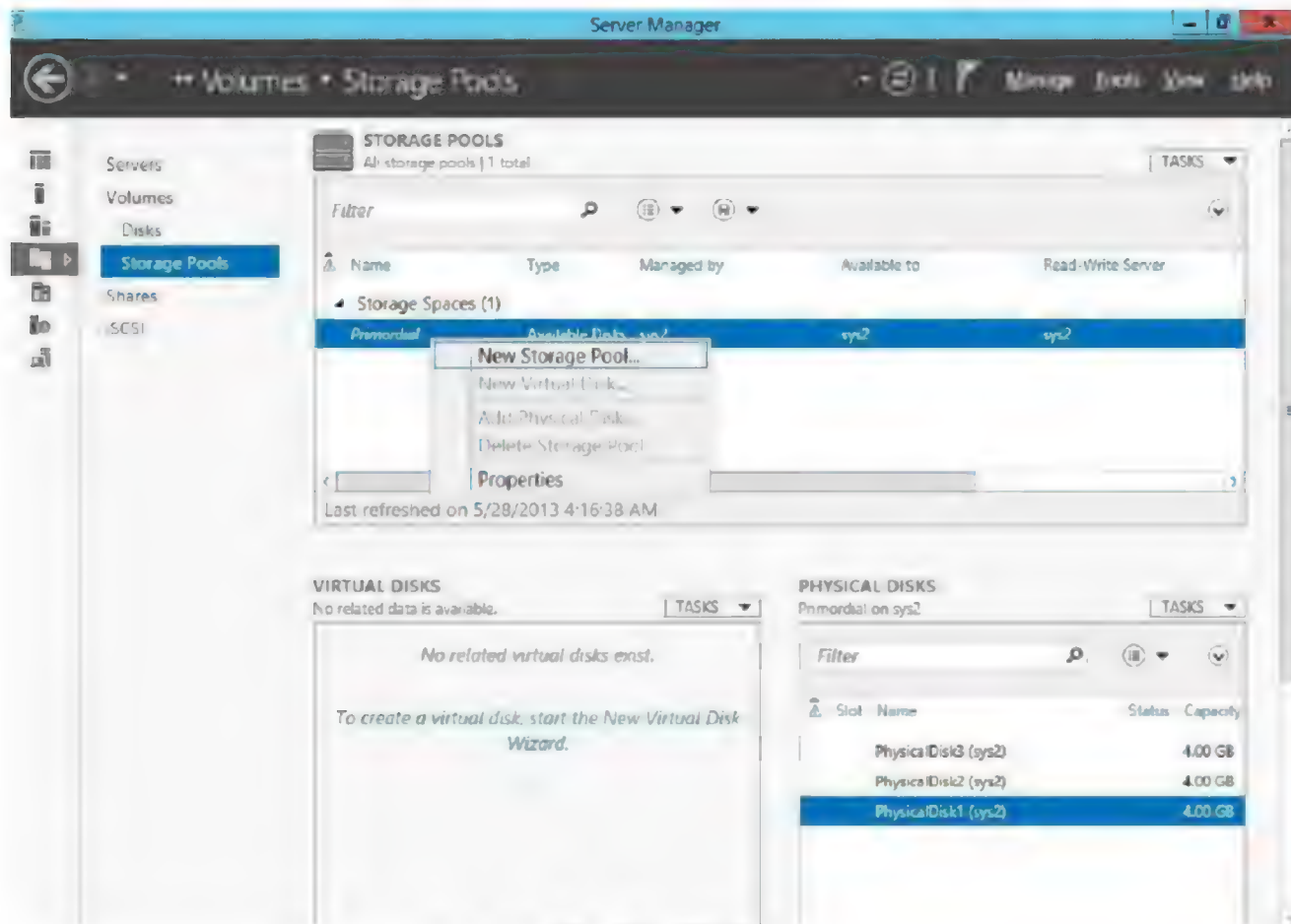


## SYS1 – CONFIGURATION

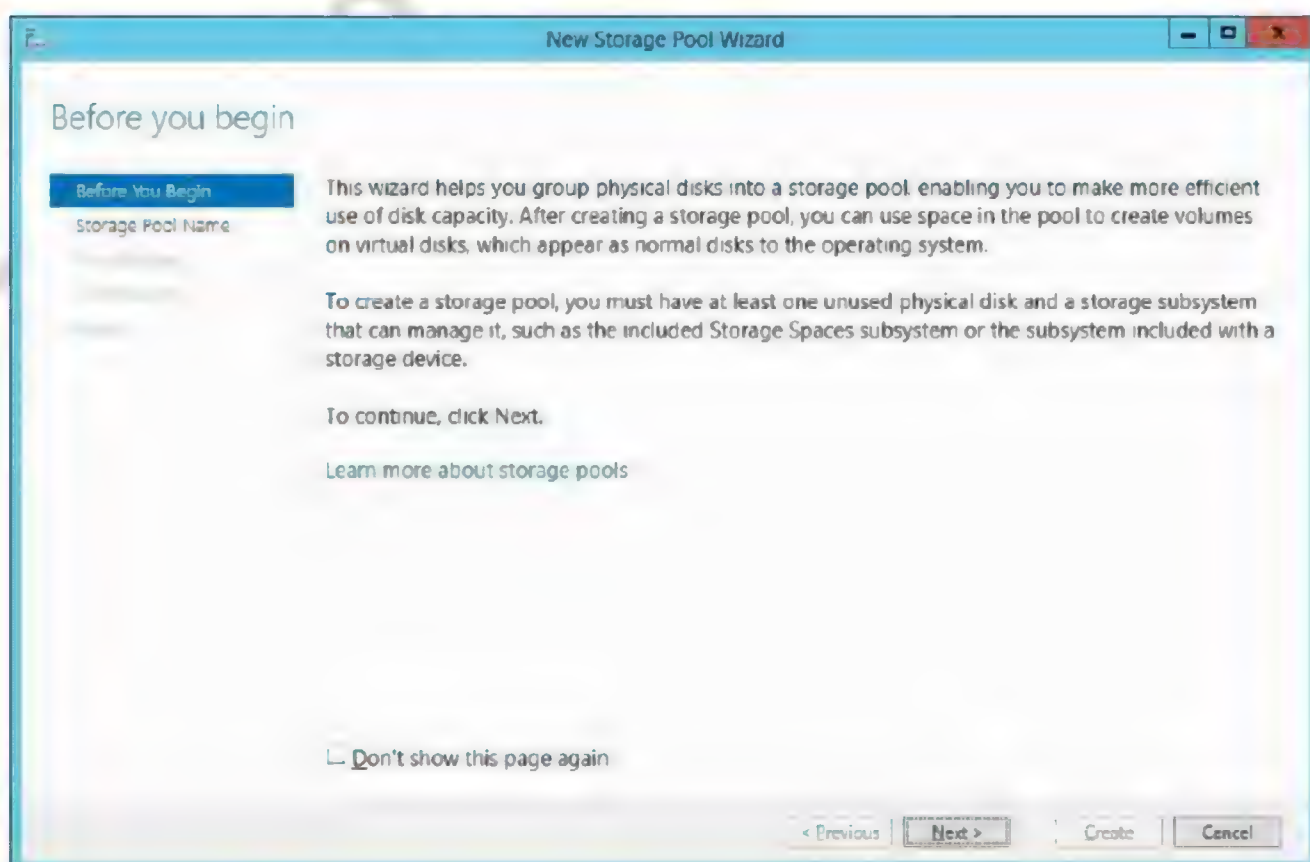
1. Create multiple iSCSI Virtual Disk (Ex: Vdisk1, Vdisk2,Vdisk3...)

## SYS2 – CONFIGURATION

1. Go to Server Manager → File and Storage Services → Storage Pools → select **New Storage Pool**.



2. In Before you begin page, click **Next**.



3. Enter **Name** (Ex: Pool1), click **Next**.

**New Storage Pool Wizard**

Specify a storage pool name and subsystem

Before You Begin  
**Storage Pool Name**  
 Physical Disks

Name: Pool1  
 Description:

Select the group of available disks (also known as a primordial pool) that you want to use:

Managed by	Available to	Subsystem	Primordial Pool
sys2	sys2	Storage Spaces	Primordial

< Previous   Next >   Create   Cancel

4. Check the boxes to select the physical disk for storage pool, click **Next**.

**New Storage Pool Wizard**

Select physical disks for the storage pool

Before You Begin  
 Storage Pool Name  
**Physical Disks**  
 Information

Select physical disks for the storage pool, and choose whether any disks should be allocated as hot spares that replace failed disks.

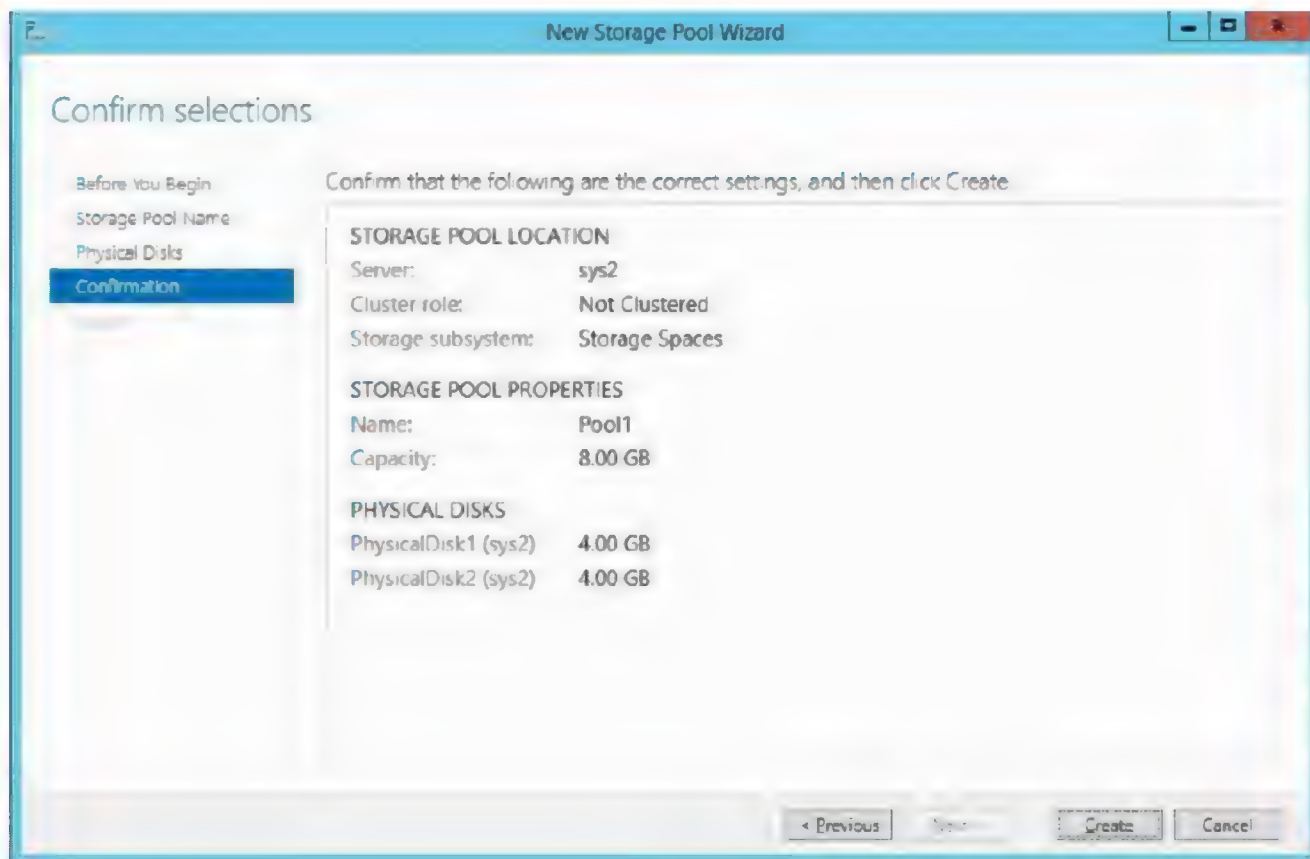
Physical disks:

<input type="checkbox"/>	Slot	Name	Capacity	Bus	RPM	Model	Allocation	Chassis
<input checked="" type="checkbox"/>		PhysicalDis...	4.00 GB	ISCSI		Virtual HD	Automatic	
<input checked="" type="checkbox"/>		PhysicalDis...	4.00 GB	ISCSI		Virtual HD	Automatic	

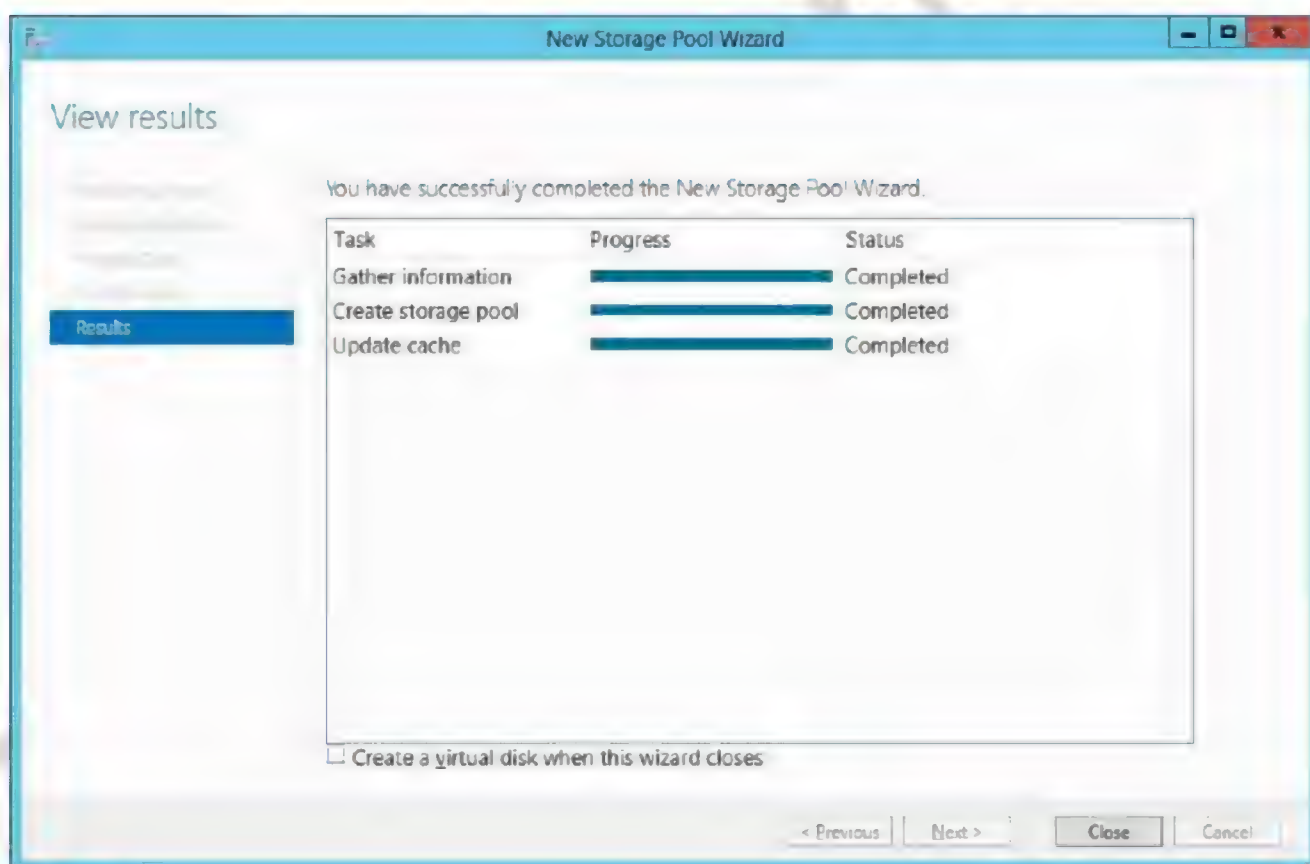
Total selected capacity: 8.00 GB  
 Selecting these disks will create a local pool.

< Previous   Next >   Create   Cancel

- Click **Create**.

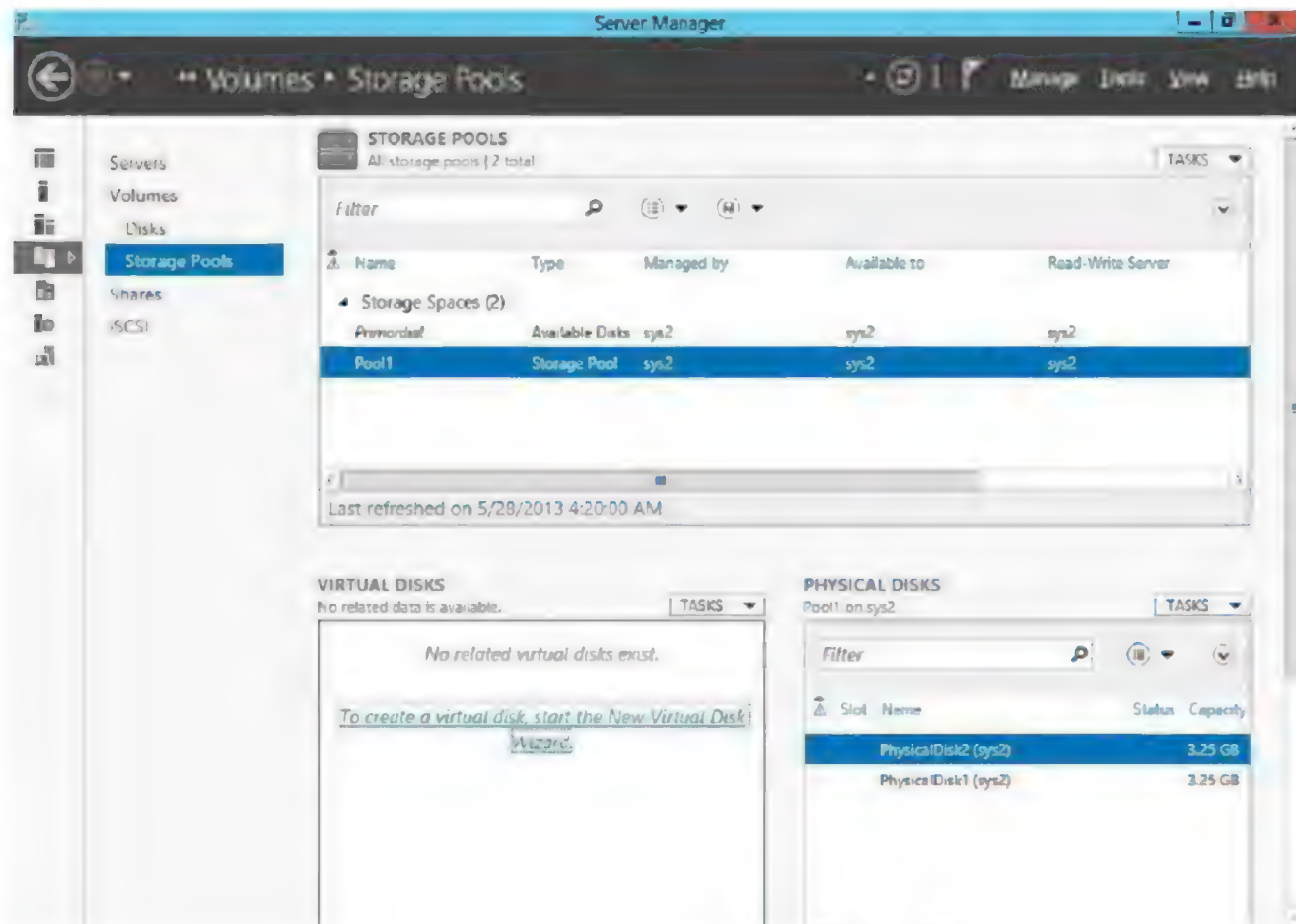


- Click **Close**.

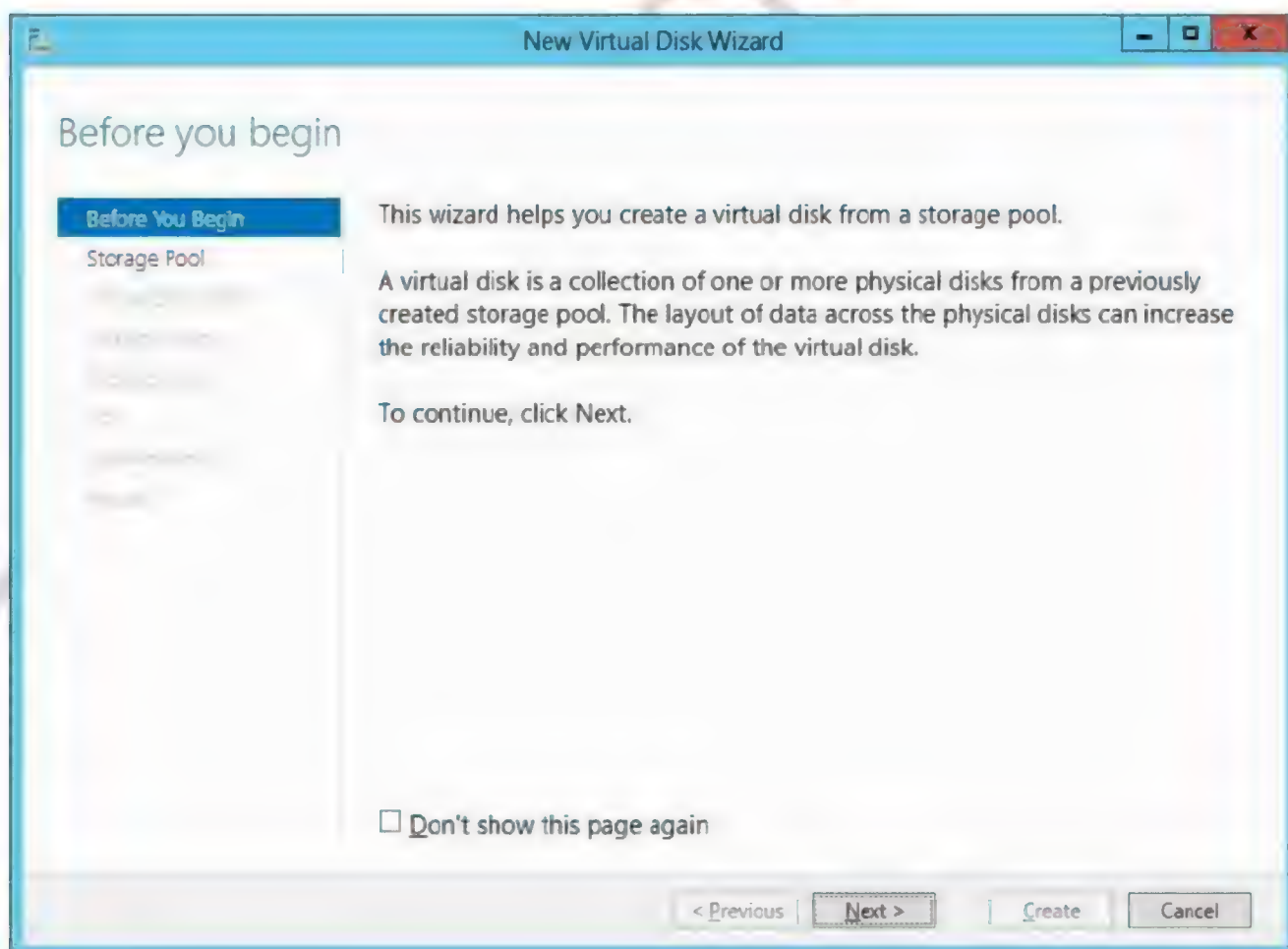




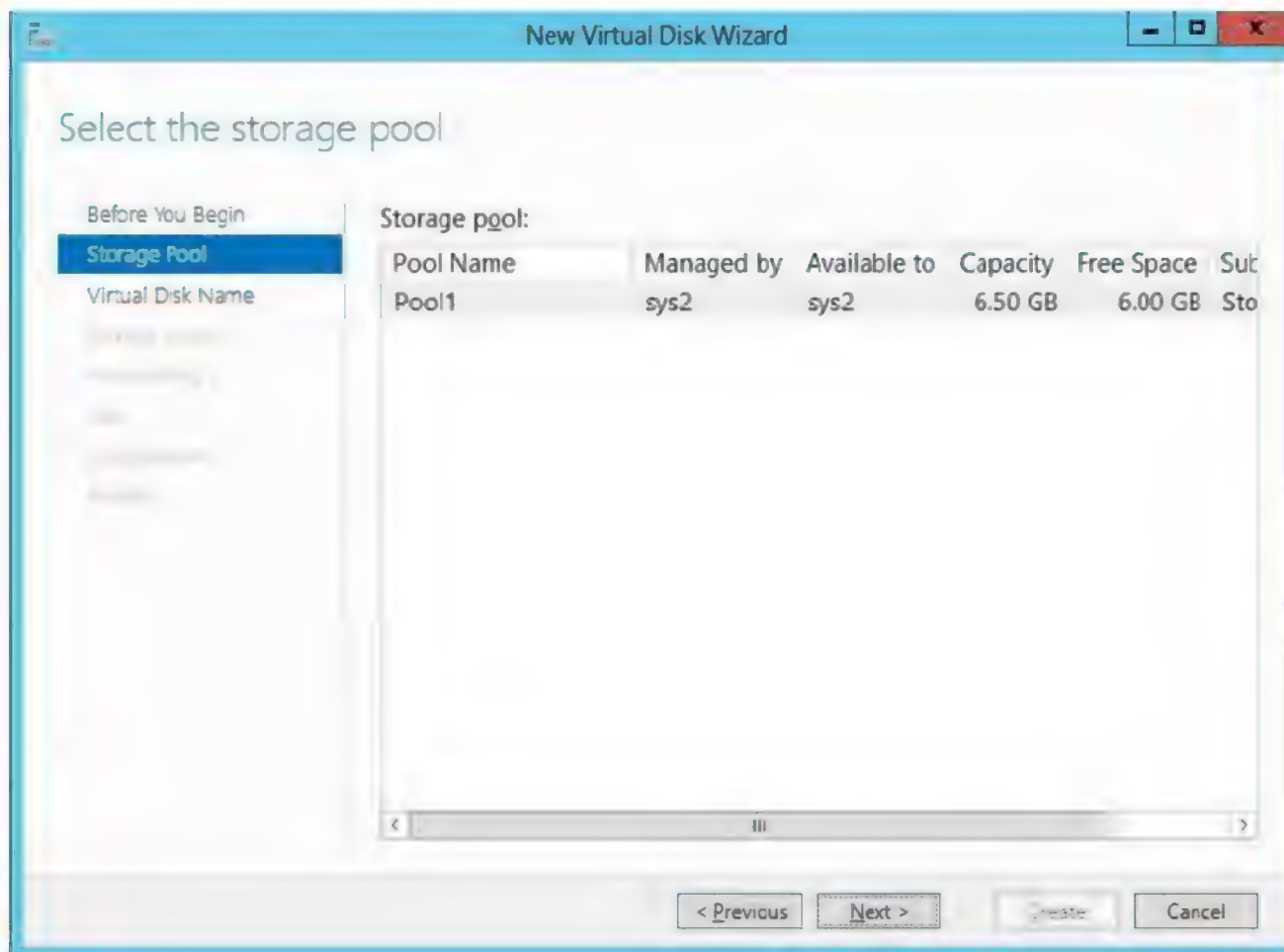
7. In Storage Pools, select Pool1, and click **To create a virtual disk, start the New Virtual Disk Wizard.**



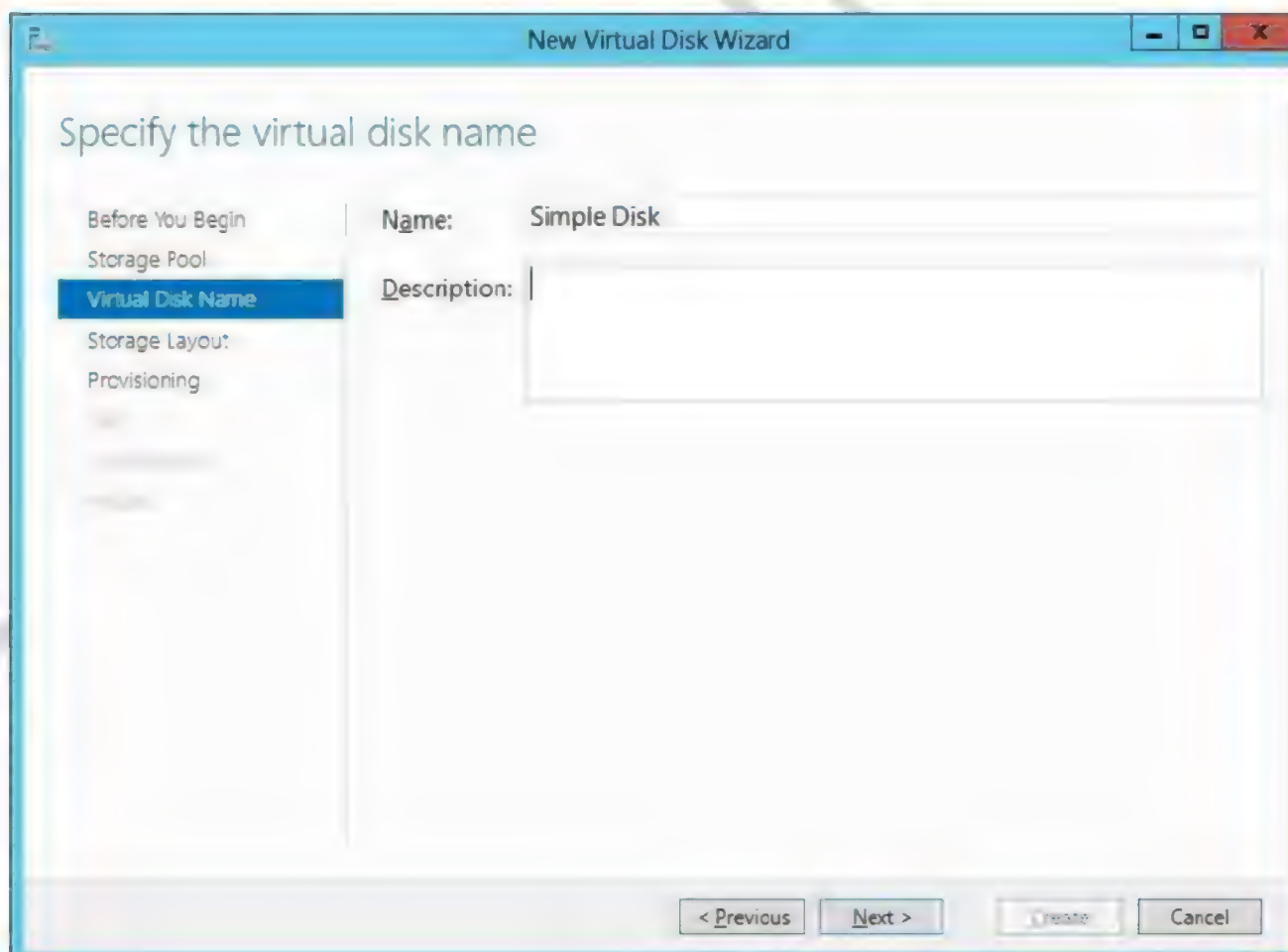
8. In Before you begin page, click **Next.**



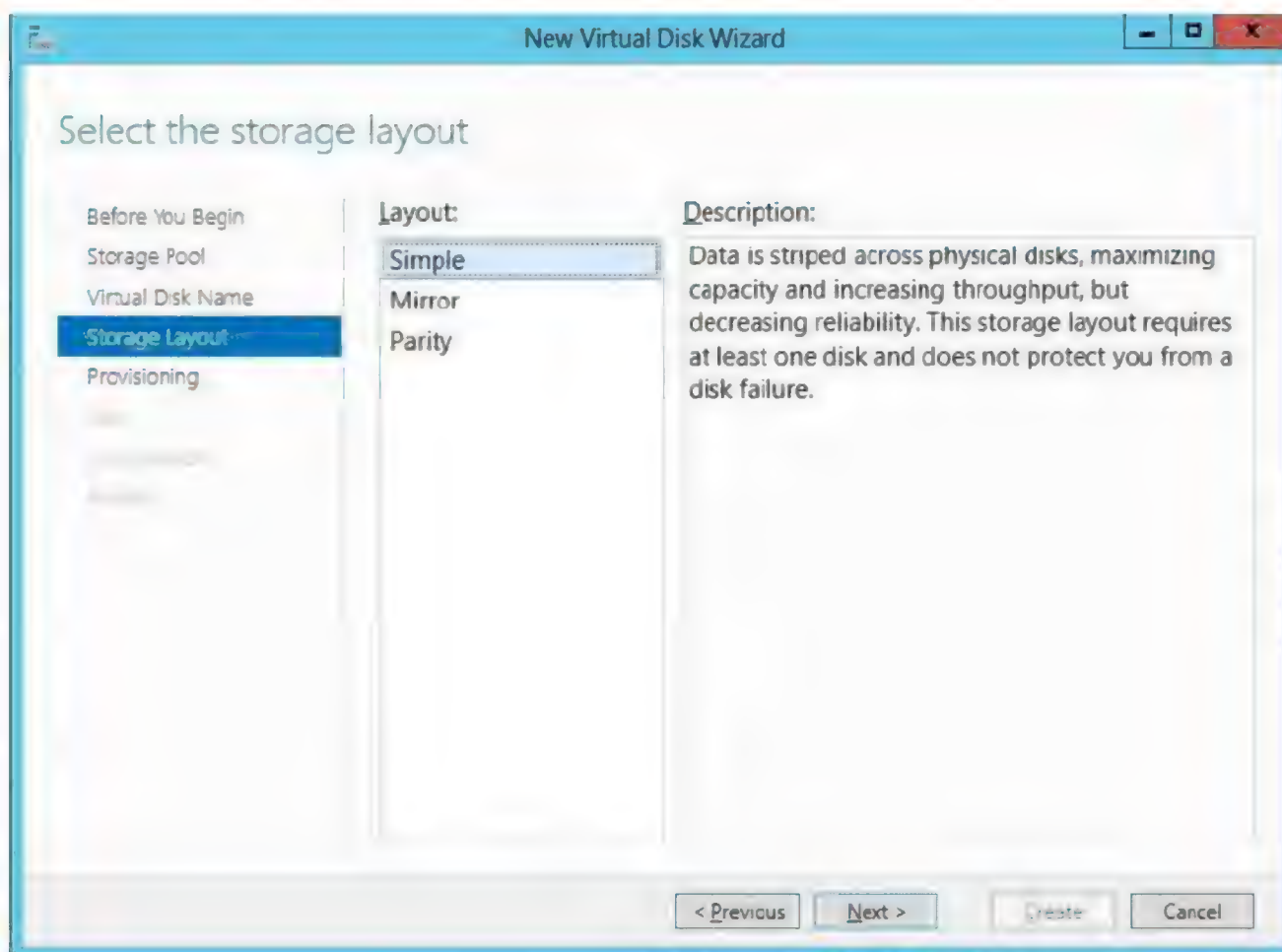
9. Select the storage pool (Ex:Pool1), click **Next**.



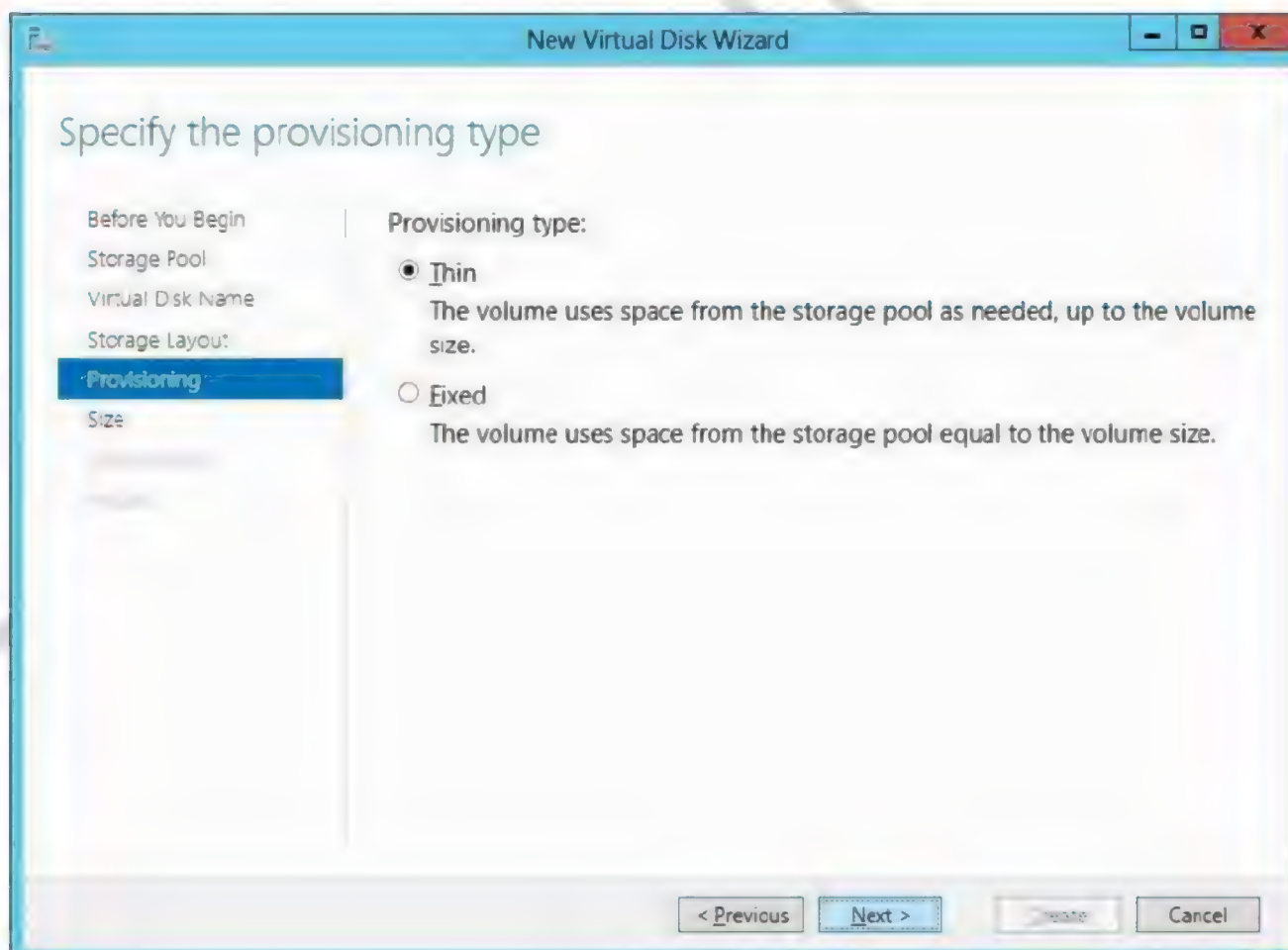
10. Enter **Name** (Ex: Simple Disk), click **Next**.



11. Select the Layout **Simple**, click **Next**.



12. Select Thin or Fixed, click **Next**.





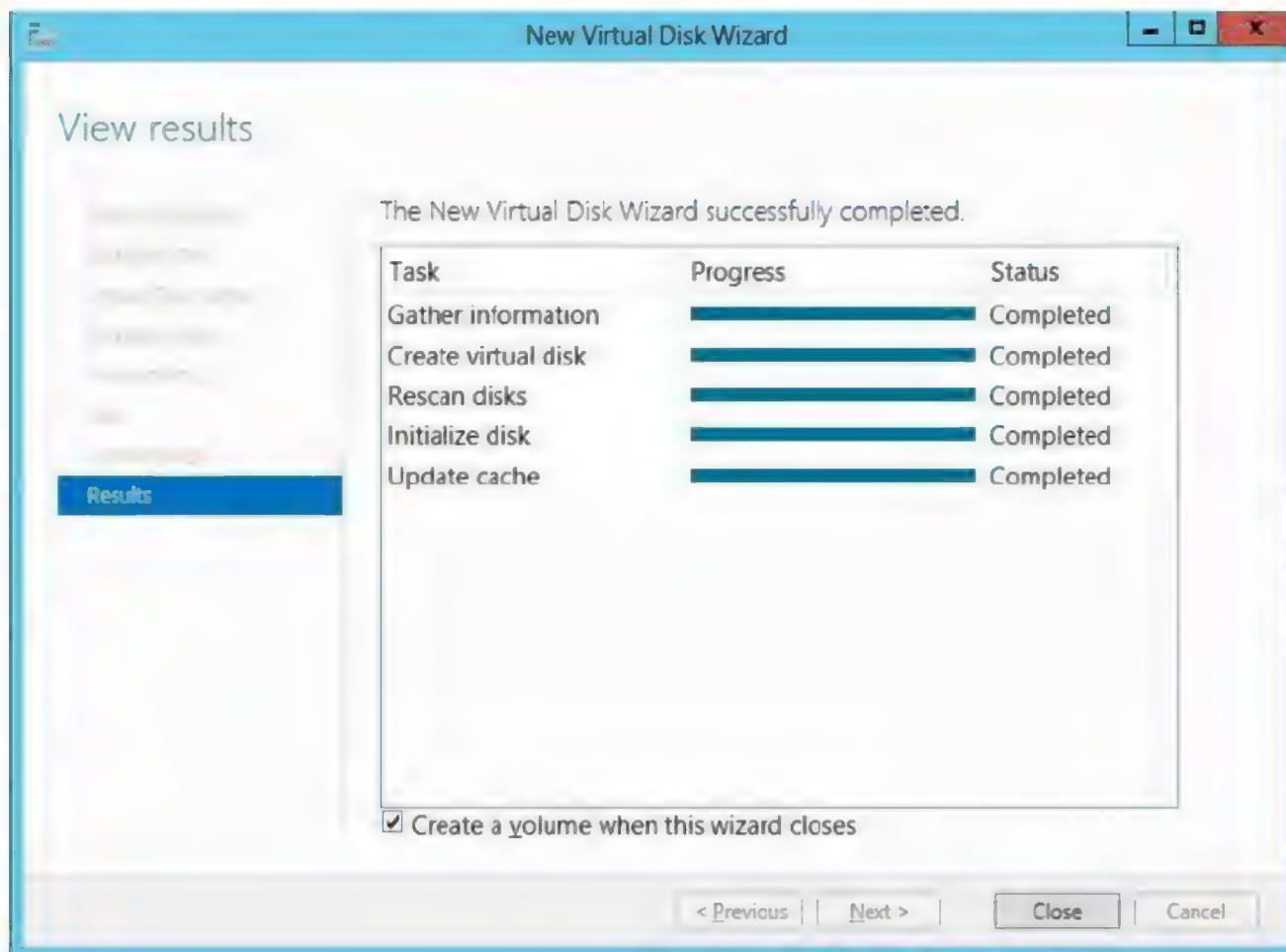
13. Enter the size of the virtual disk, click **Next**.

The screenshot shows the 'New Virtual Disk Wizard' window with the title bar 'New Virtual Disk Wizard'. The main heading is 'Specify the size of the virtual disk'. On the left, a navigation pane lists steps: 'Before You Begin', 'Storage Pool', 'Virtual Disk Name', 'Storage Layout', 'Provisioning', 'Size' (selected), and 'Confirmation'. The main area contains explanatory text about fixed provisioning and storage layouts, followed by 'Storage pool free space: 6.00 GB'. Under the 'Specify size' radio button, 'Virtual disk size' is set to '5' with a 'GB' dropdown. An unchecked checkbox 'Create the largest virtual disk possible, up to the specified size' is also present. At the bottom, there are buttons for '< Previous', 'Next >', 'Create', and 'Cancel'.

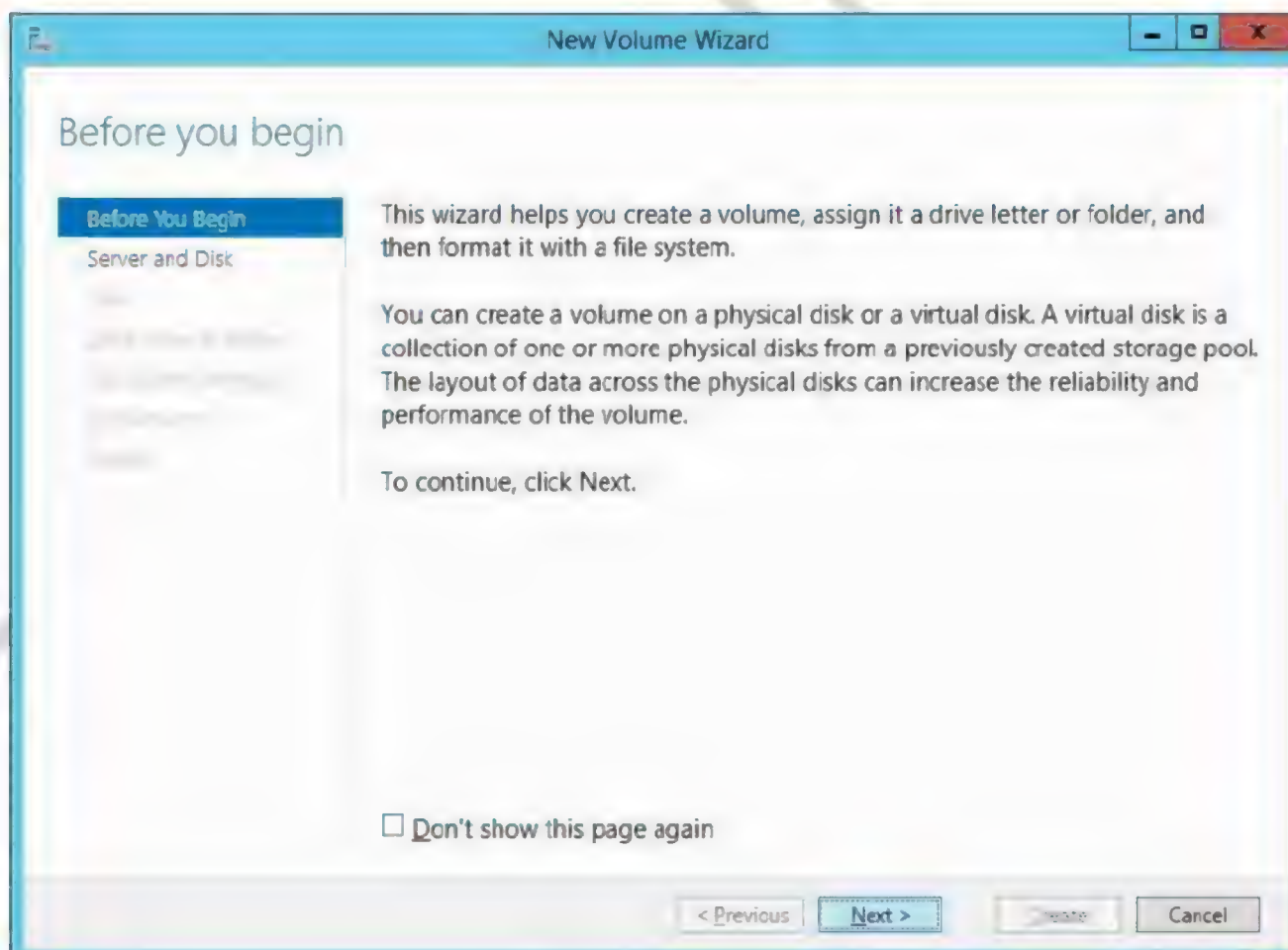
14. Click **Create**.

The screenshot shows the 'New Virtual Disk Wizard' window with the title bar 'New Virtual Disk Wizard'. The main heading is 'Confirm selections'. The left navigation pane shows 'Confirmation' as the selected step. The main area prompts the user to 'Confirm that the following are the correct settings, and then click Create.' It displays two sections: 'VIRTUAL DISK LOCATION' with details like Server: sys2, Subsystem: Storage Spaces, Storage pool name: Pool1, Status: OK, and Free space: 6.00 GB; and 'VIRTUAL DISK PROPERTIES' with details like Name: Simple Disk, Storage layout: Simple, Provisioning type: Thin, and Requested size: 5.00 GB. At the bottom, buttons for '< Previous', 'Next >', 'Create', and 'Cancel' are visible.

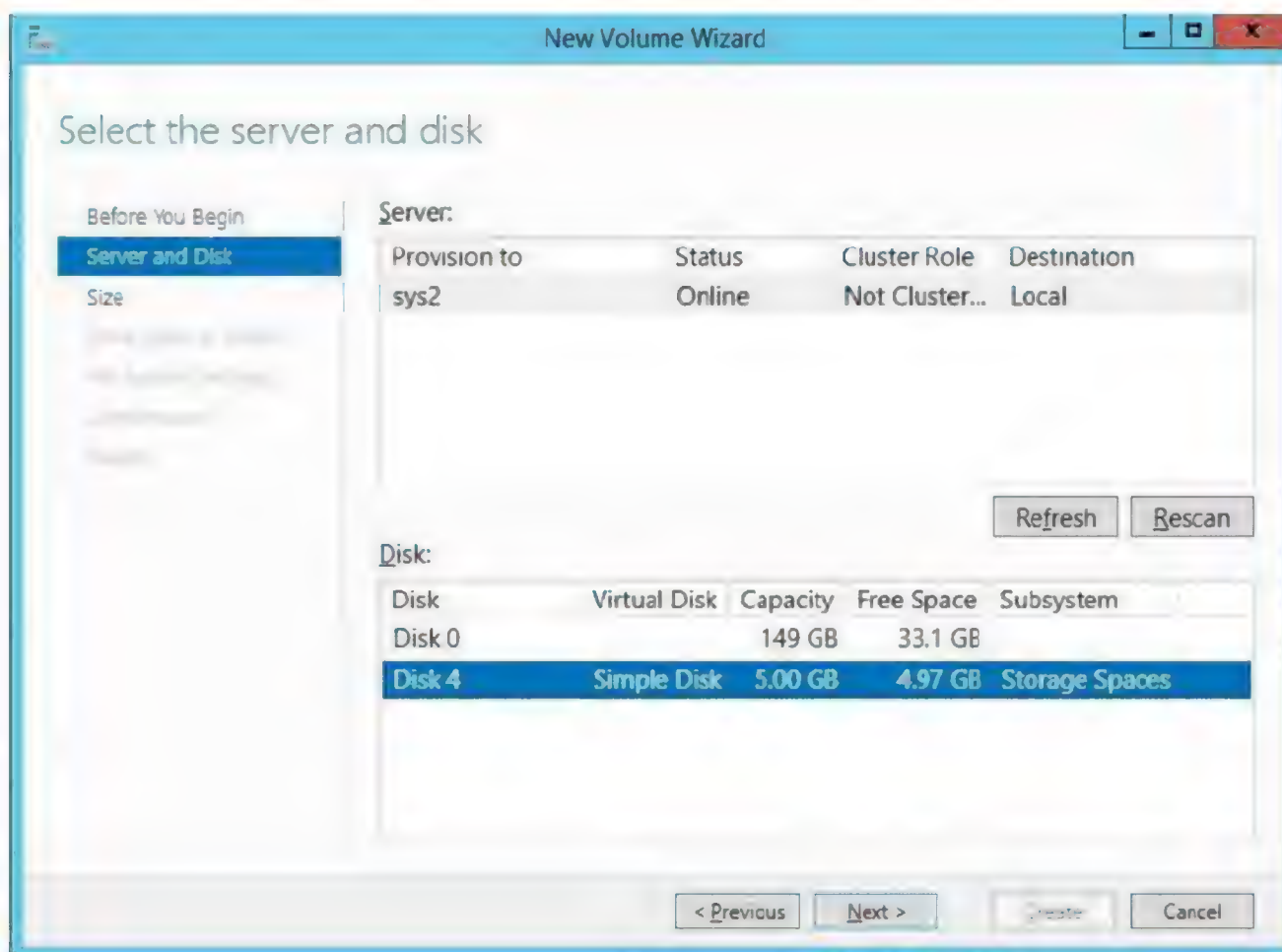
15. Click **Close**, verify the check box Create a volume when wizard closes.



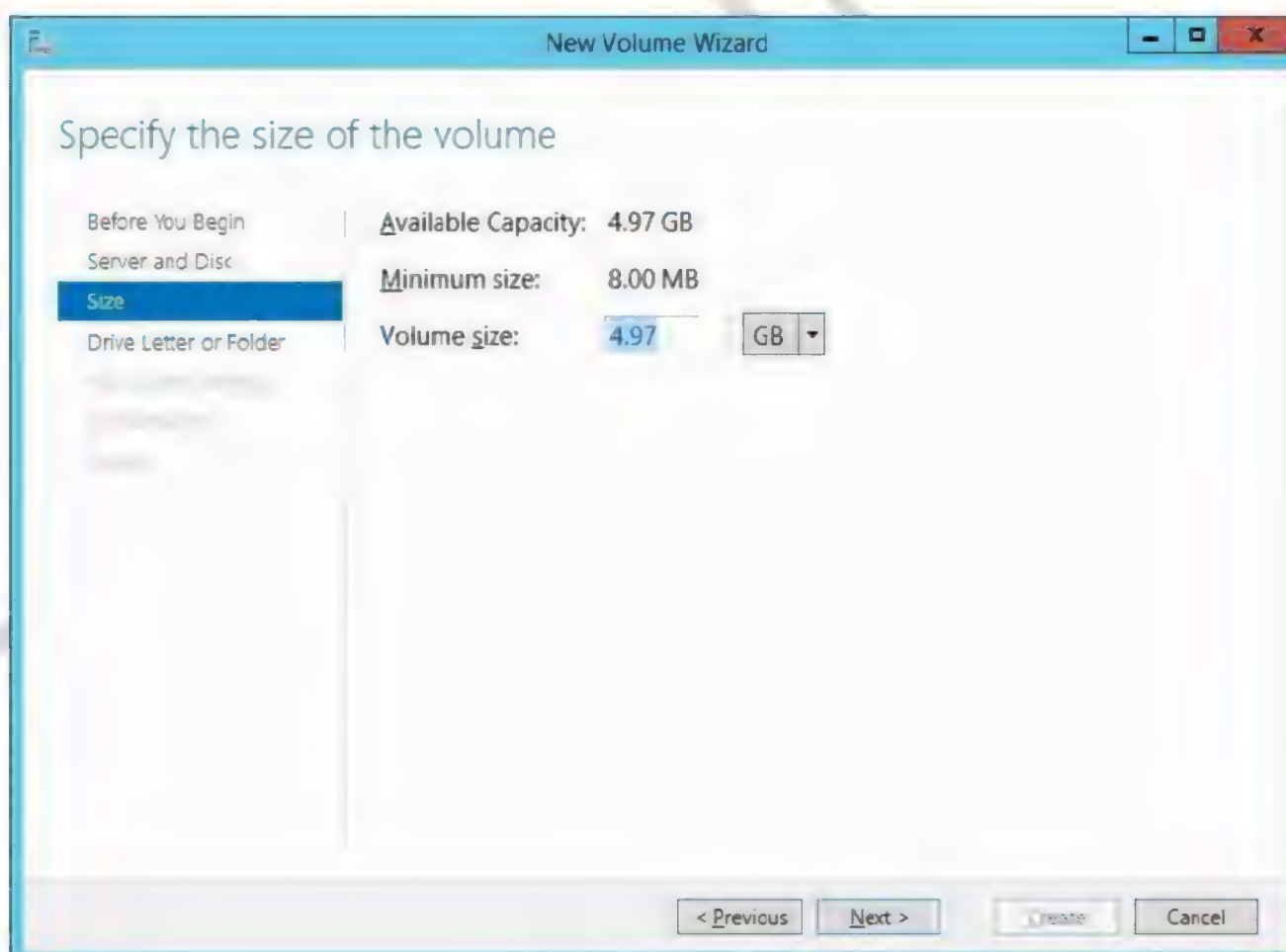
16. In Before you begin page, click **Next**.



17. Select the disk (Simple Disk), click **Next**.



18. Enter the size of the volume, click **Next**.

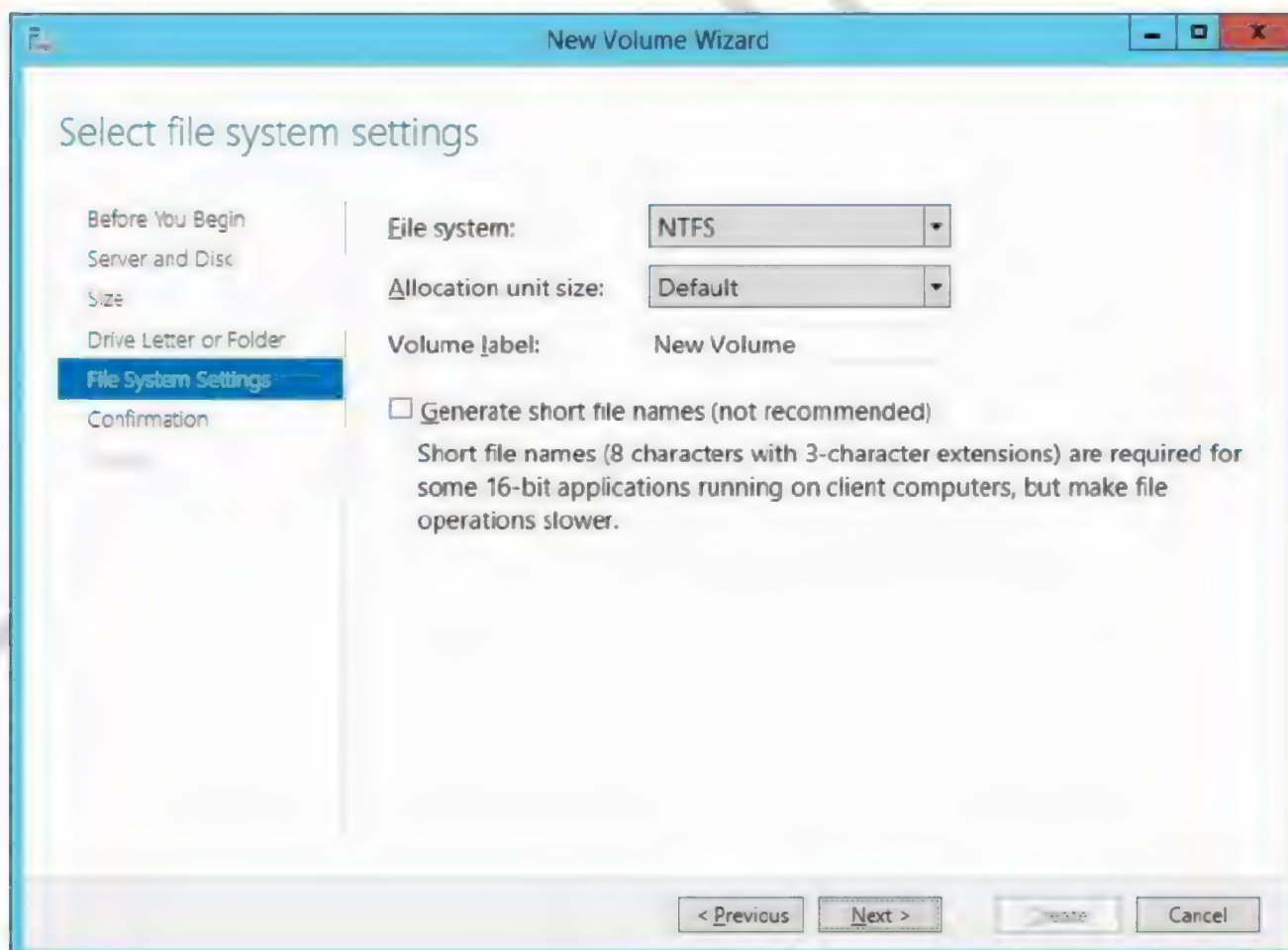




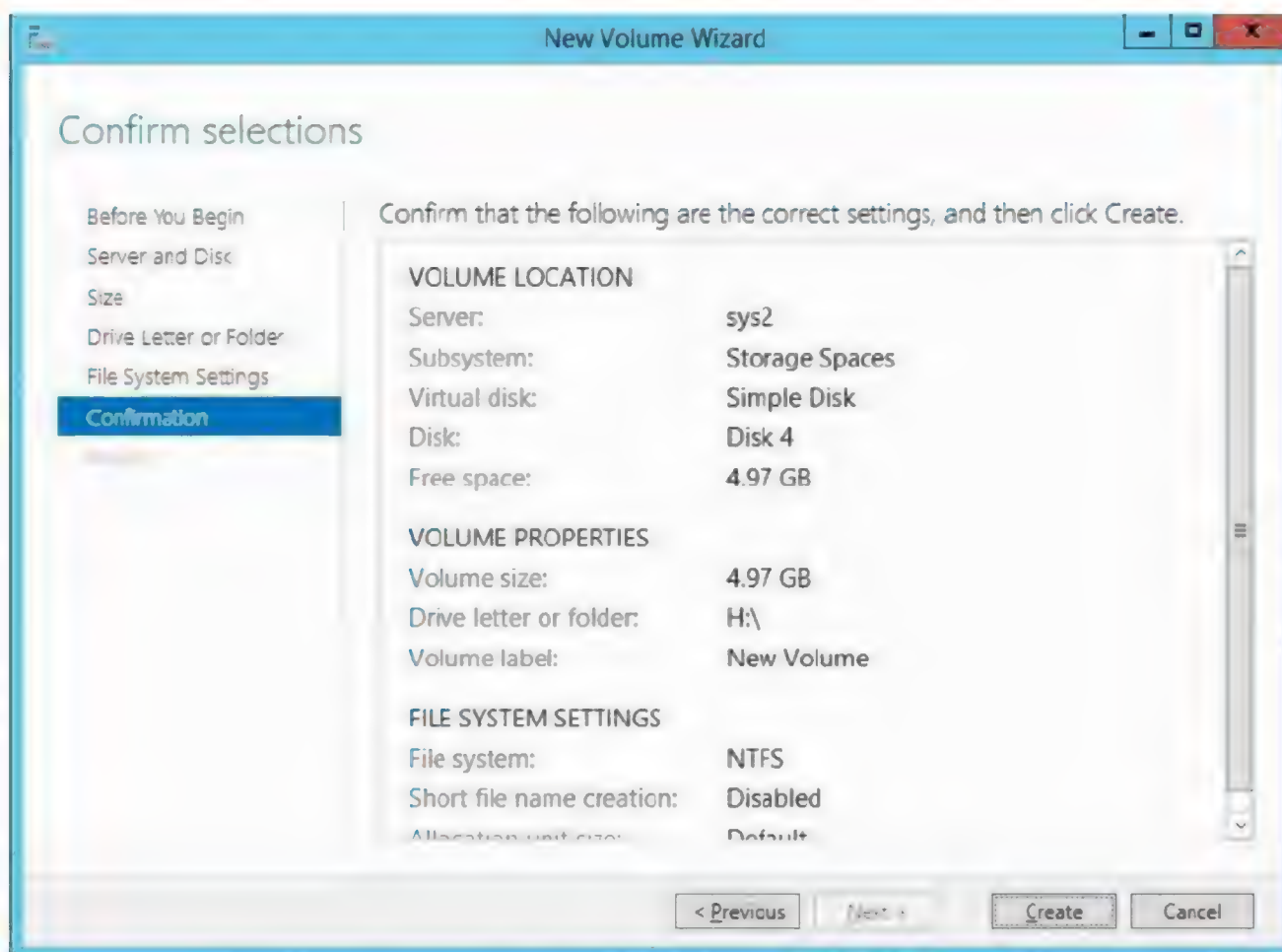
19. Select the Drive letter, click **Next**.



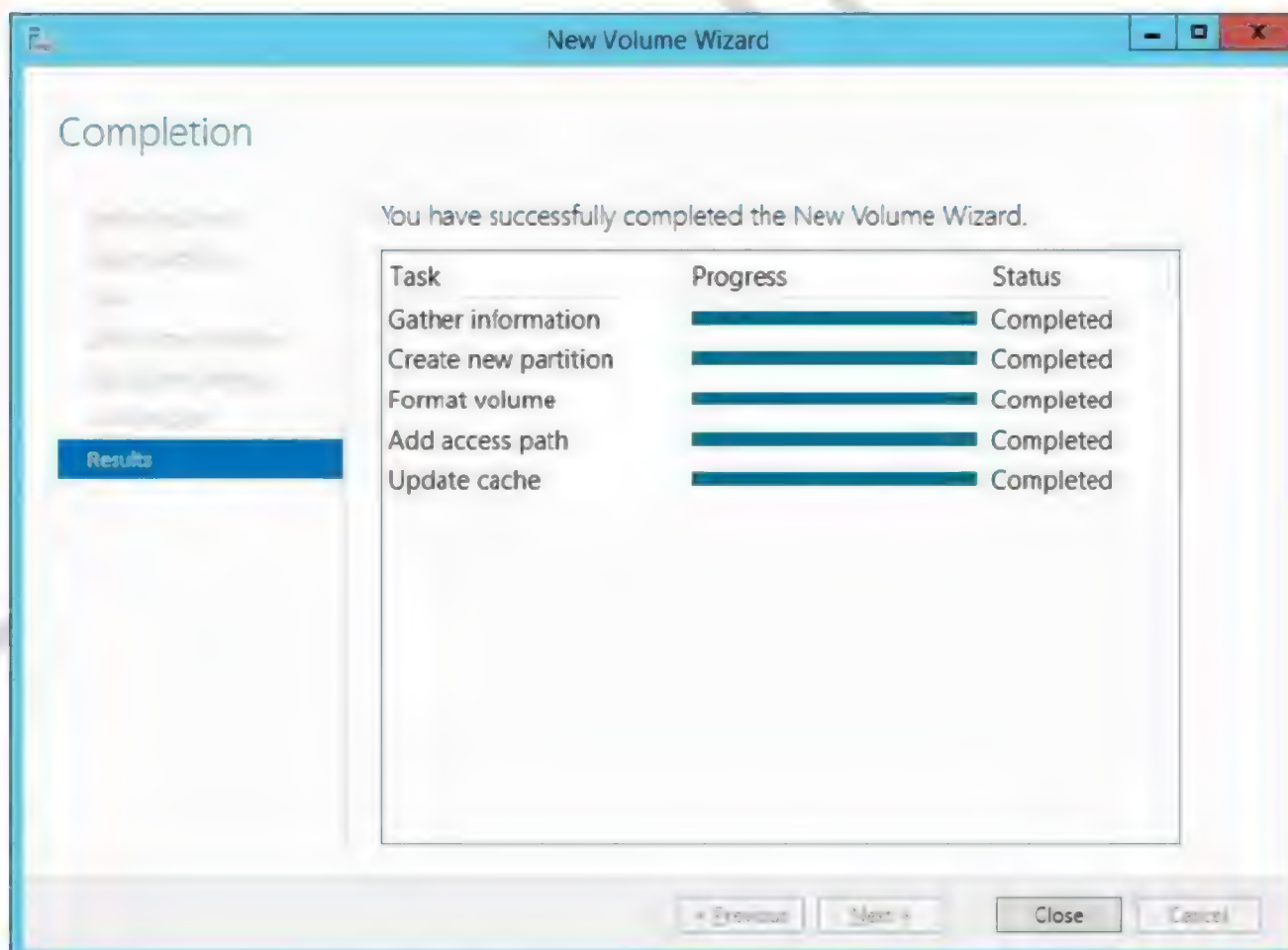
20. Select the File system, click **Next**.



21. Click **Create**.

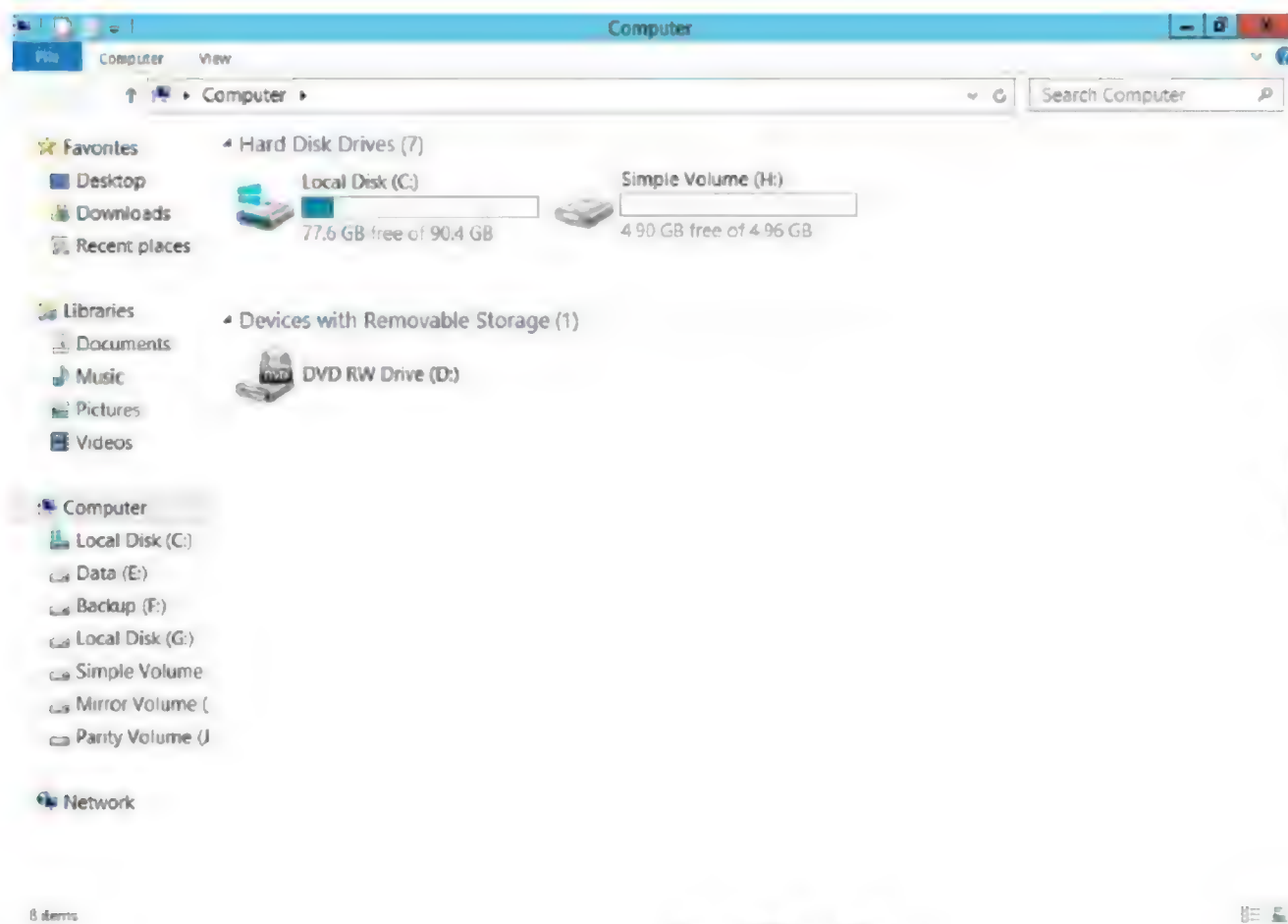


22. Click **Close**.



**Verification :**

1. Go to Start, select Computer Icon and verify for the Simple volume.





## Lab – 79: Creating Mirror Volume (RAID-1)

### Objective:

To configure mirror disk for fault tolerance.

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### Member Server / Client

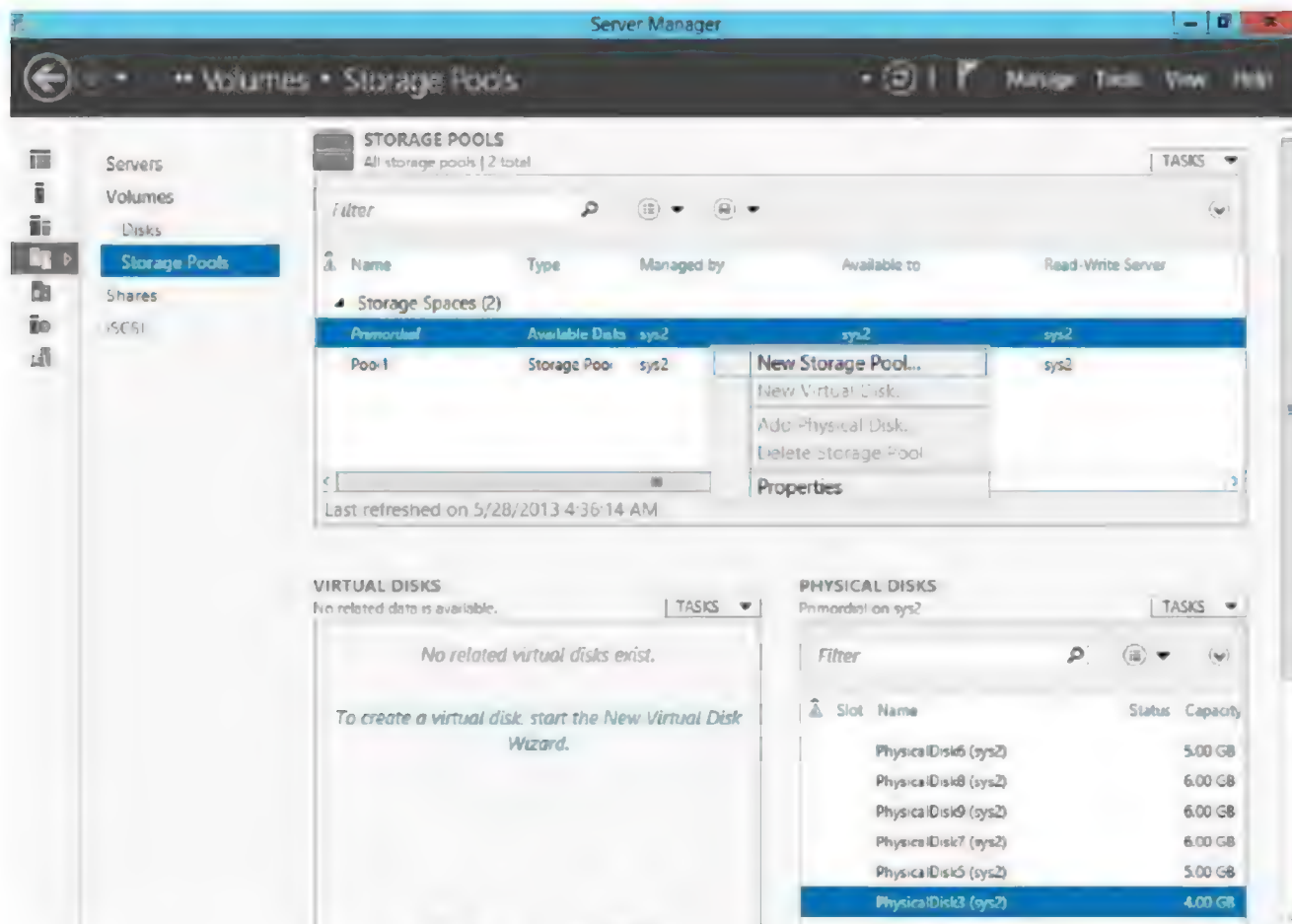
IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

## SYS1 – CONFIGURATION

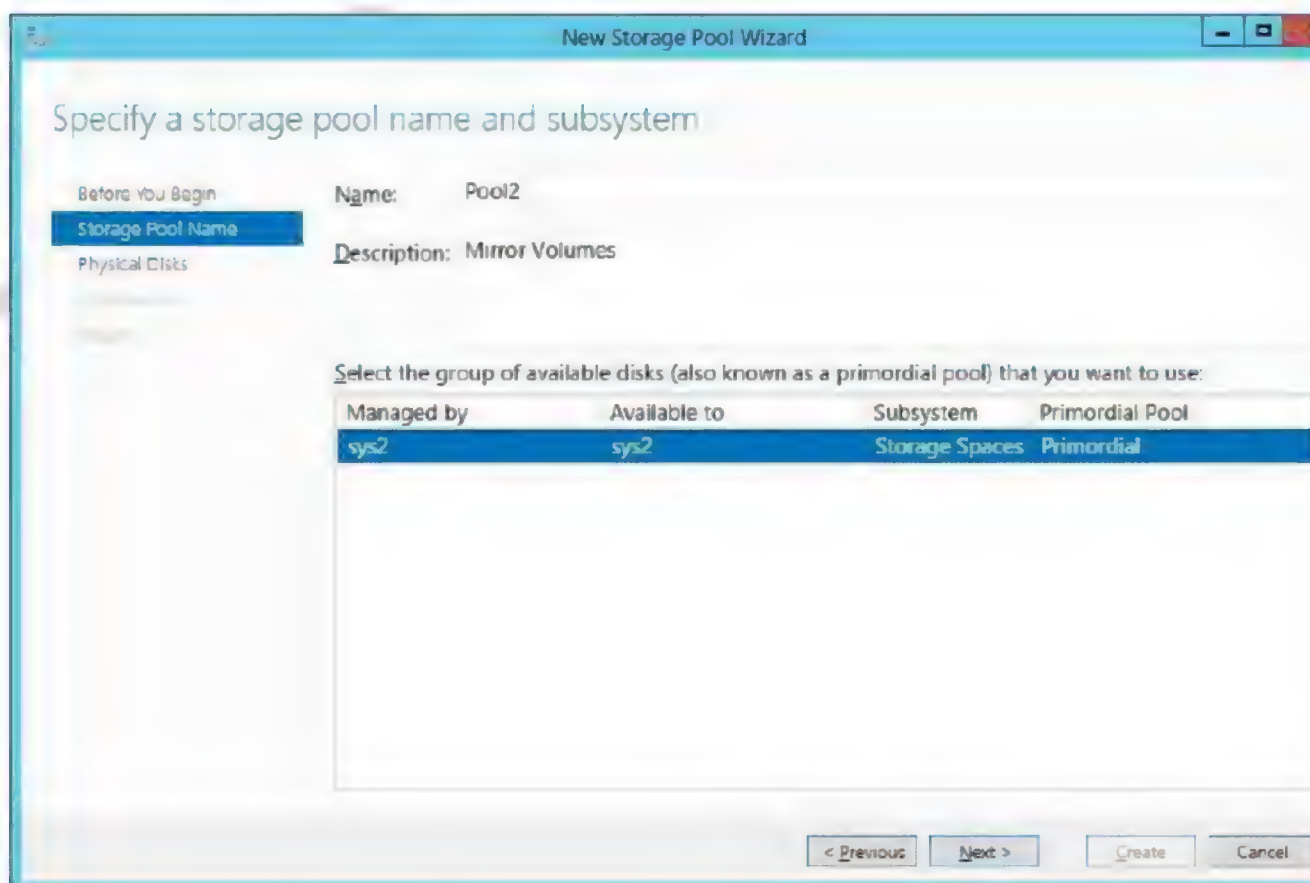
1. Create multiple iSCSI Virtual Disk (Ex: Vdisk4, Vdisk5, Vdisk6...)

## SYS2 – CONFIGURATION

1. Go to Server Manager → File and Storage Services → Storage Pools → right click Primordial storage pool → select **NewStoragePool**.



2. Enter Name (Ex: Pool2), click **Next**.



3. Check the boxes and select the physical disks for the Storage pool, click **Next**.

New Storage Pool Wizard

Select physical disks for the storage pool

Before You Begin  
Storage Pool Name  
**Physical Disks**  
Confirmation

Select physical disks for the storage pool, and choose whether any disks should be allocated as hot spares that replace failed disks.

Physical disks:

<input checked="" type="checkbox"/>	Slot	Name	Capacity	Bus	RPM	Model	Allocation	Chassis
<input checked="" type="checkbox"/>		PhysicalDis...	5.00 GB	iSCSI		Virtual HD	Automatic	
<input checked="" type="checkbox"/>		PhysicalDis...	5.00 GB	iSCSI		Virtual HD	Automatic	
<input checked="" type="checkbox"/>		PhysicalDis...	5.00 GB	iSCSI		Virtual HD	Hot Spare	

Total selected capacity: 15.0 GB  
 Selecting these disks will create a local pool.

< Previous Next > Create Cancel

4. Click **Create**.

New Storage Pool Wizard

Confirm selections

Before You Begin  
Storage Pool Name  
Physical Disks  
**Confirmation**

Confirm that the following are the correct settings, and then click Create

**STORAGE POOL LOCATION**

Server: sys2  
 Cluster role: Not Clustered  
 Storage subsystem: Storage Spaces

**STORAGE POOL PROPERTIES**

Name: Pool2  
 Description: Mirror Volume  
 Capacity: 15.0 GB

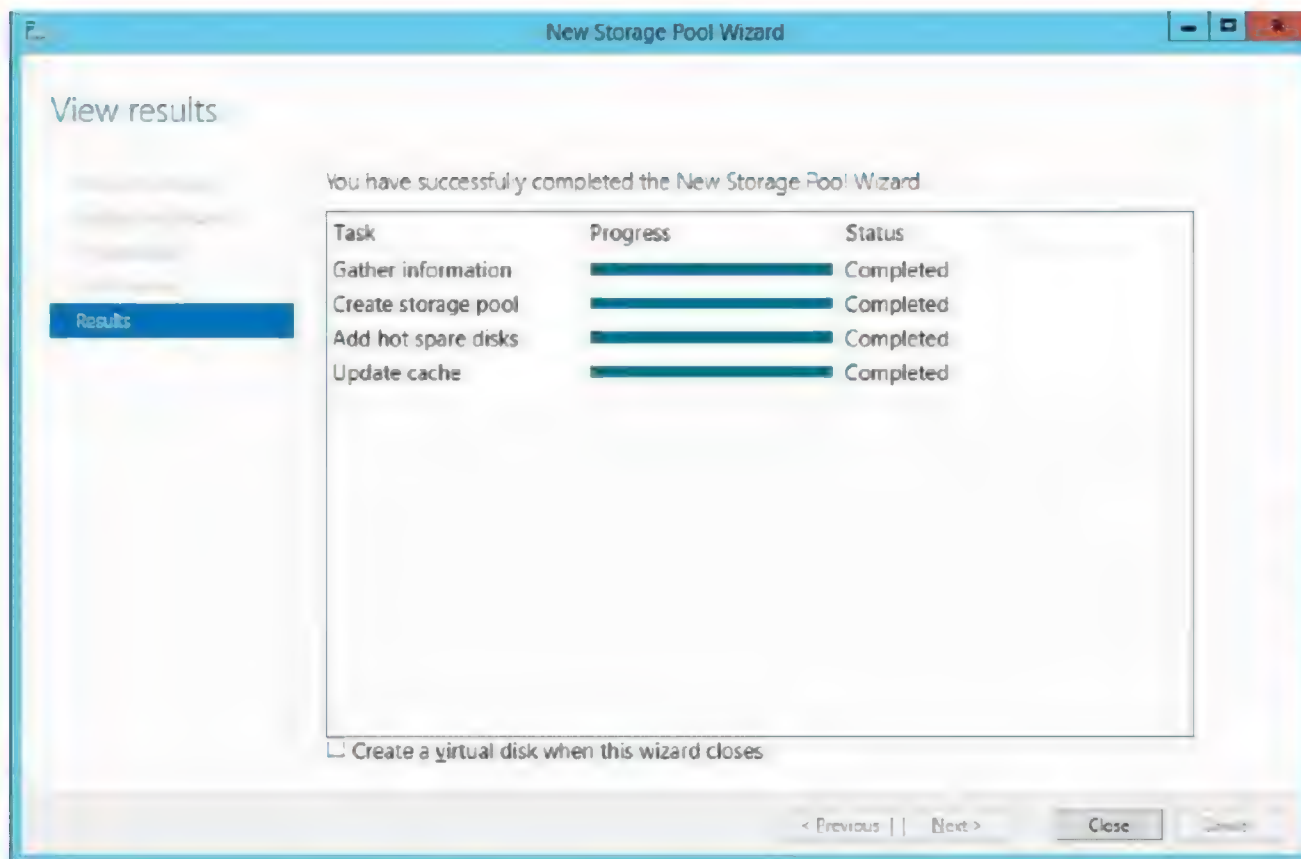
**PHYSICAL DISKS**

PhysicalDisk3 (sys2) 5.00 GB  
 PhysicalDisk5 (sys2) 5.00 GB  
 PhysicalDisk6 (sys2) 5.00 GB

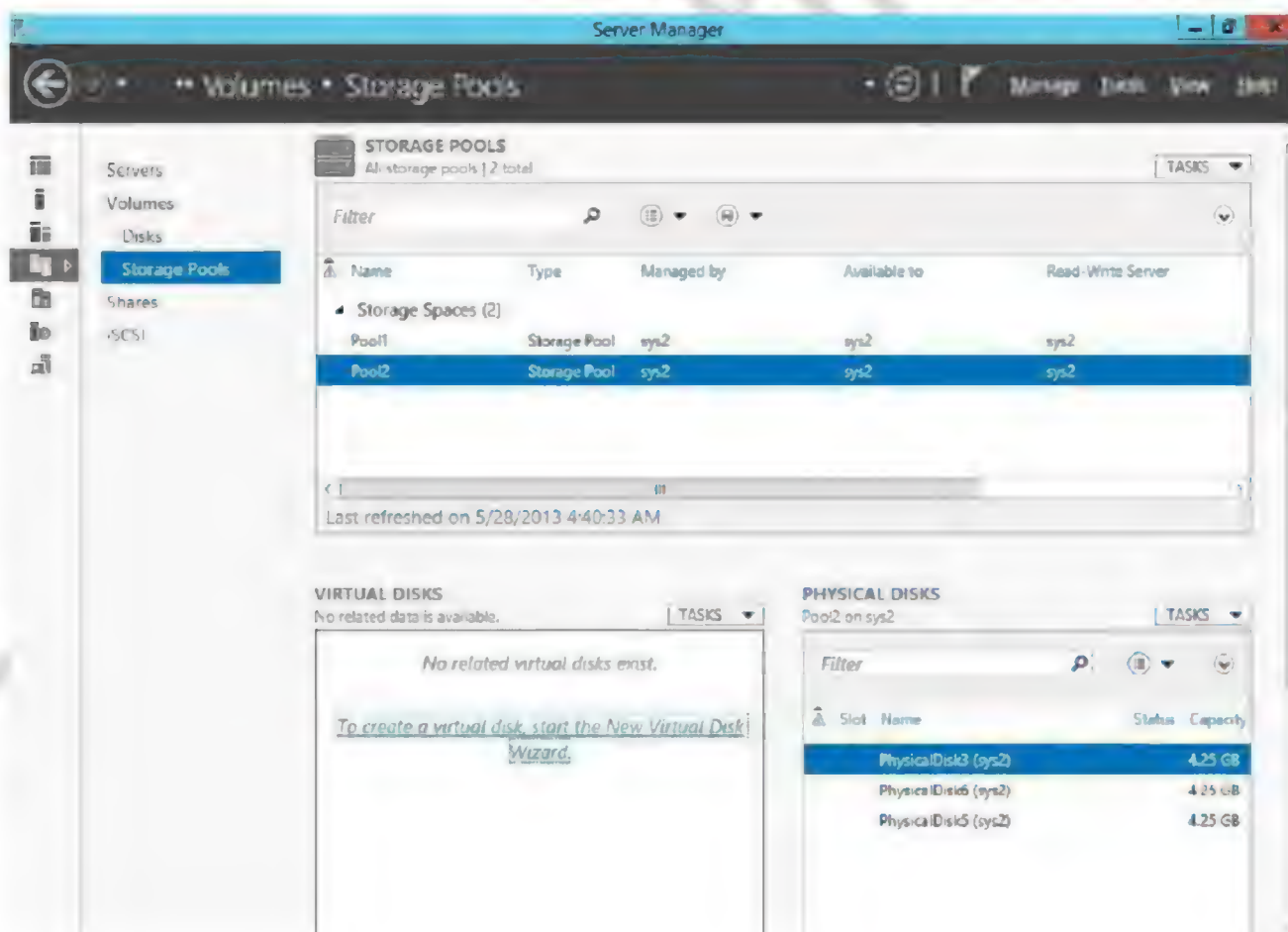
< Previous Next > Create Cancel



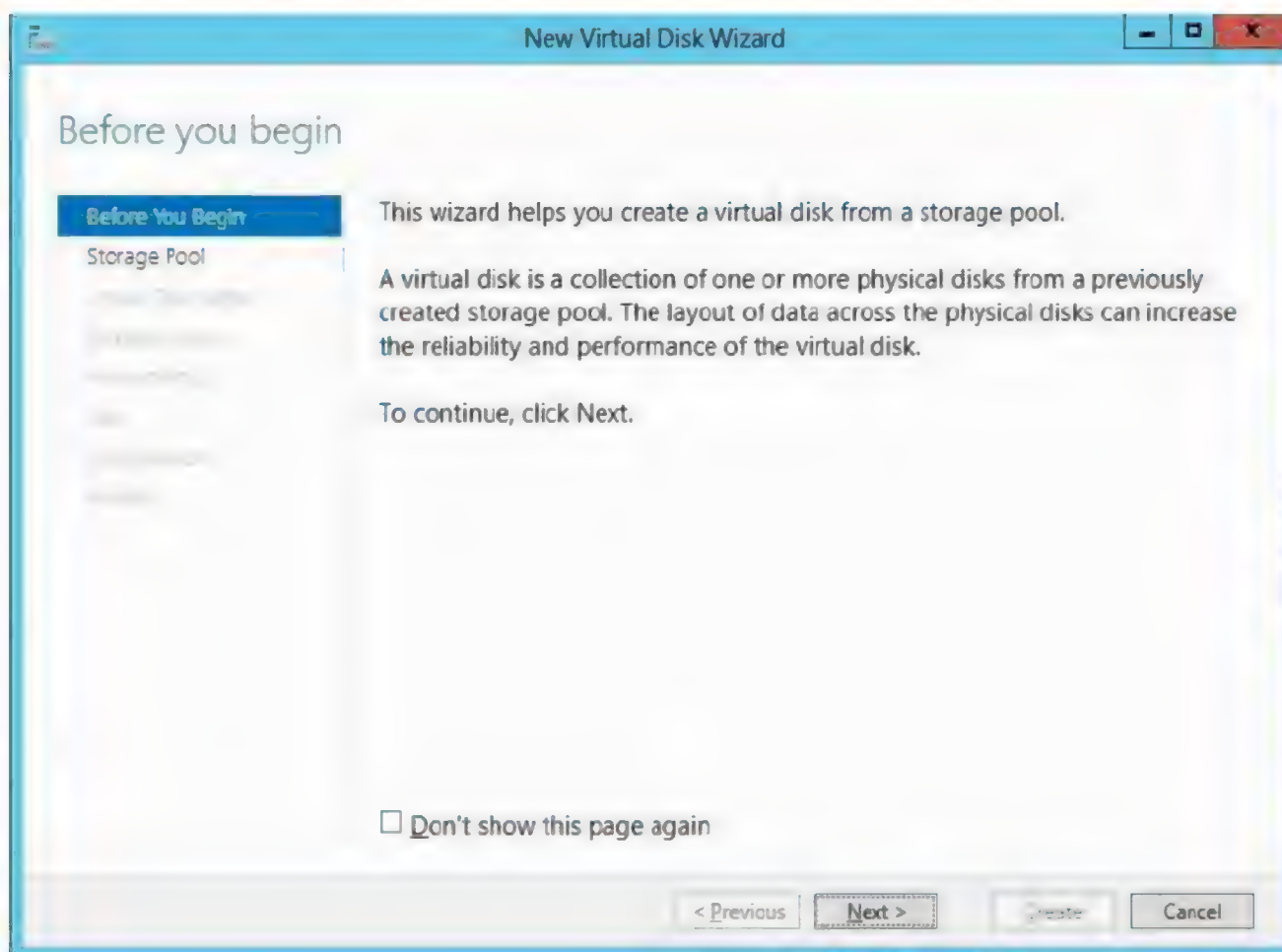
- Click **Close**.



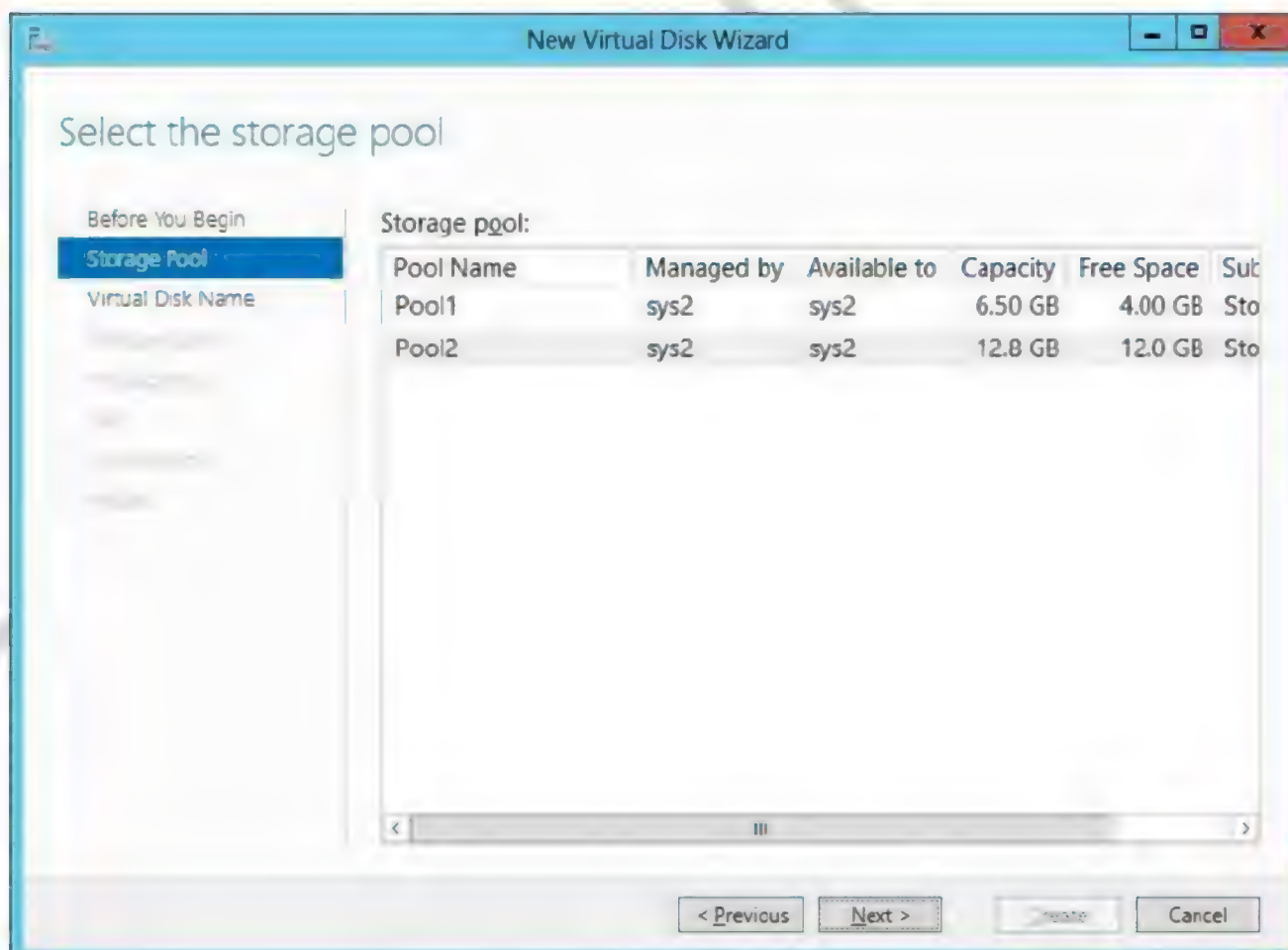
- In Server Manager, Storage Pools, select Pool2, and click **To create a virtual disk, start the New Virtual Disk Wizard**.



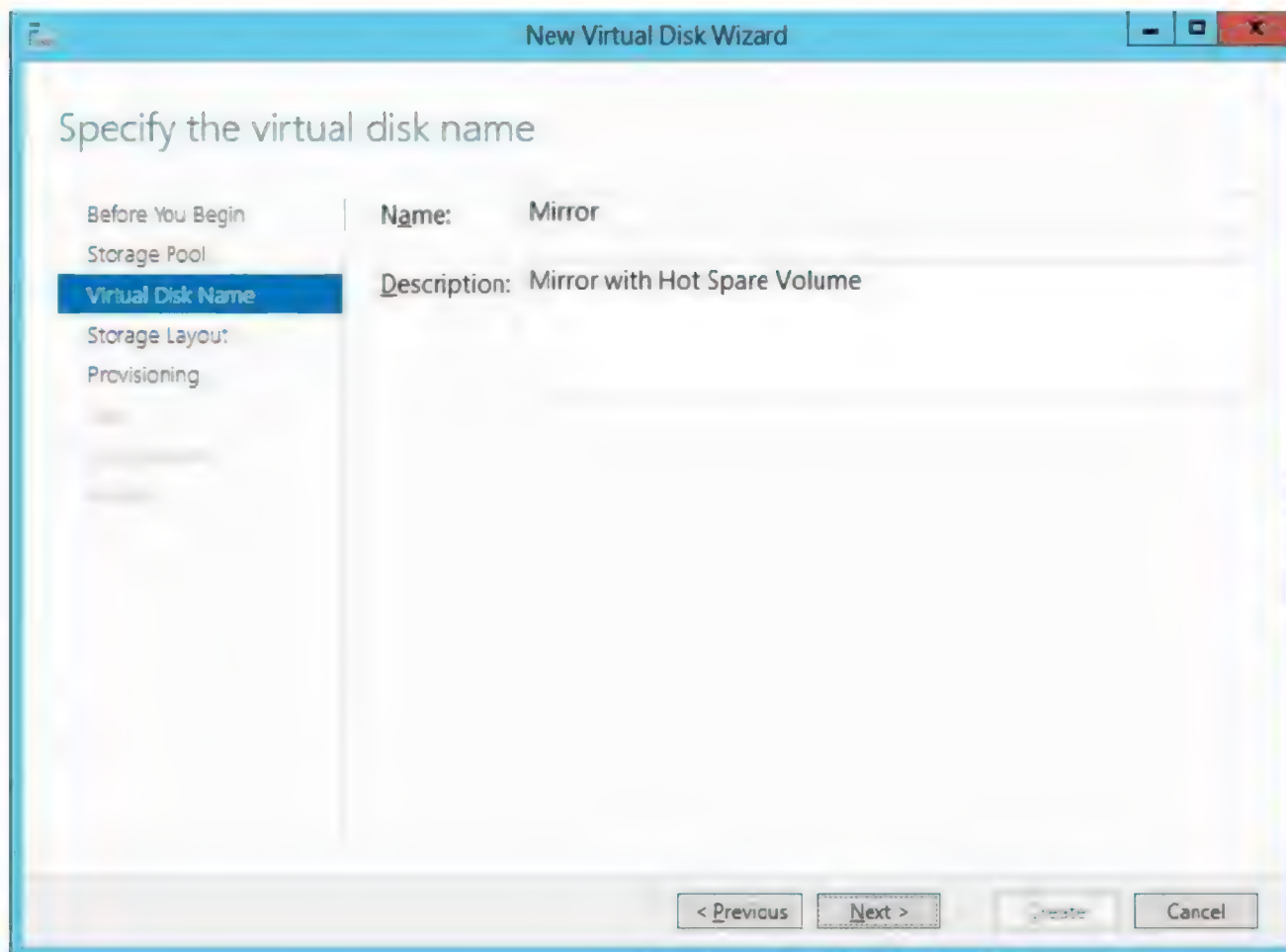
7. In Before you begin page, click **Next**.



8. Select the storage pool (Ex: Pool2), click **Next**.



9. Enter Name (Ex: Mirror), click **Next**.



New Virtual Disk Wizard

Specify the virtual disk name

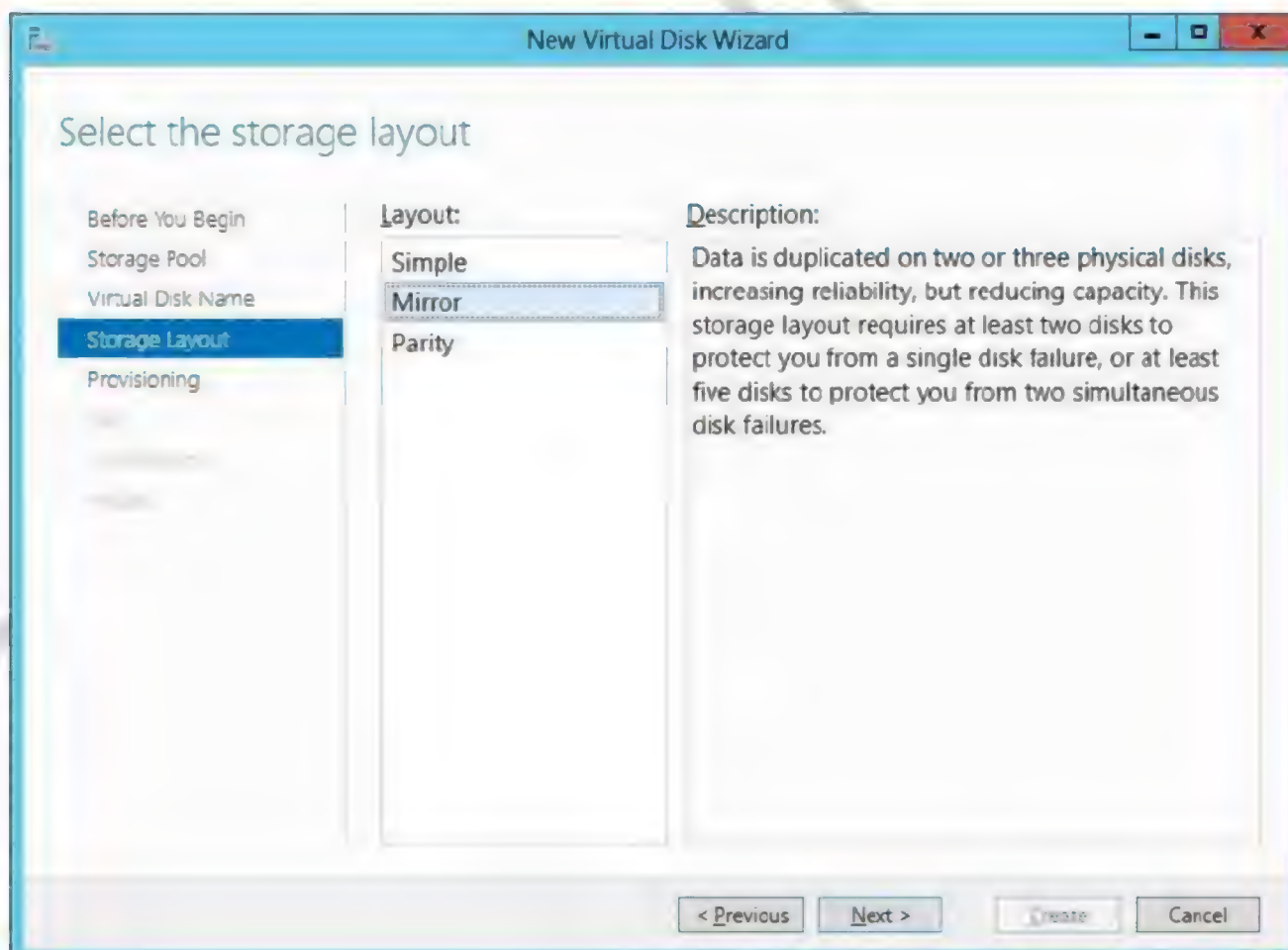
Before You Begin  
Storage Pool  
**Virtual Disk Name**  
Storage Layout:  
Provisioning

Name: Mirror

Description: Mirror with Hot Spare Volume

< Previous Next > Create Cancel

10. In Layout, select Mirror, click **Next**.



New Virtual Disk Wizard

Select the storage layout

Before You Begin  
Storage Pool  
Virtual Disk Name  
**Storage Layout**  
Provisioning

Layout:

- Simple
- Mirror**
- Parity

Description:

Data is duplicated on two or three physical disks, increasing reliability, but reducing capacity. This storage layout requires at least two disks to protect you from a single disk failure, or at least five disks to protect you from two simultaneous disk failures.

< Previous Next > Create Cancel



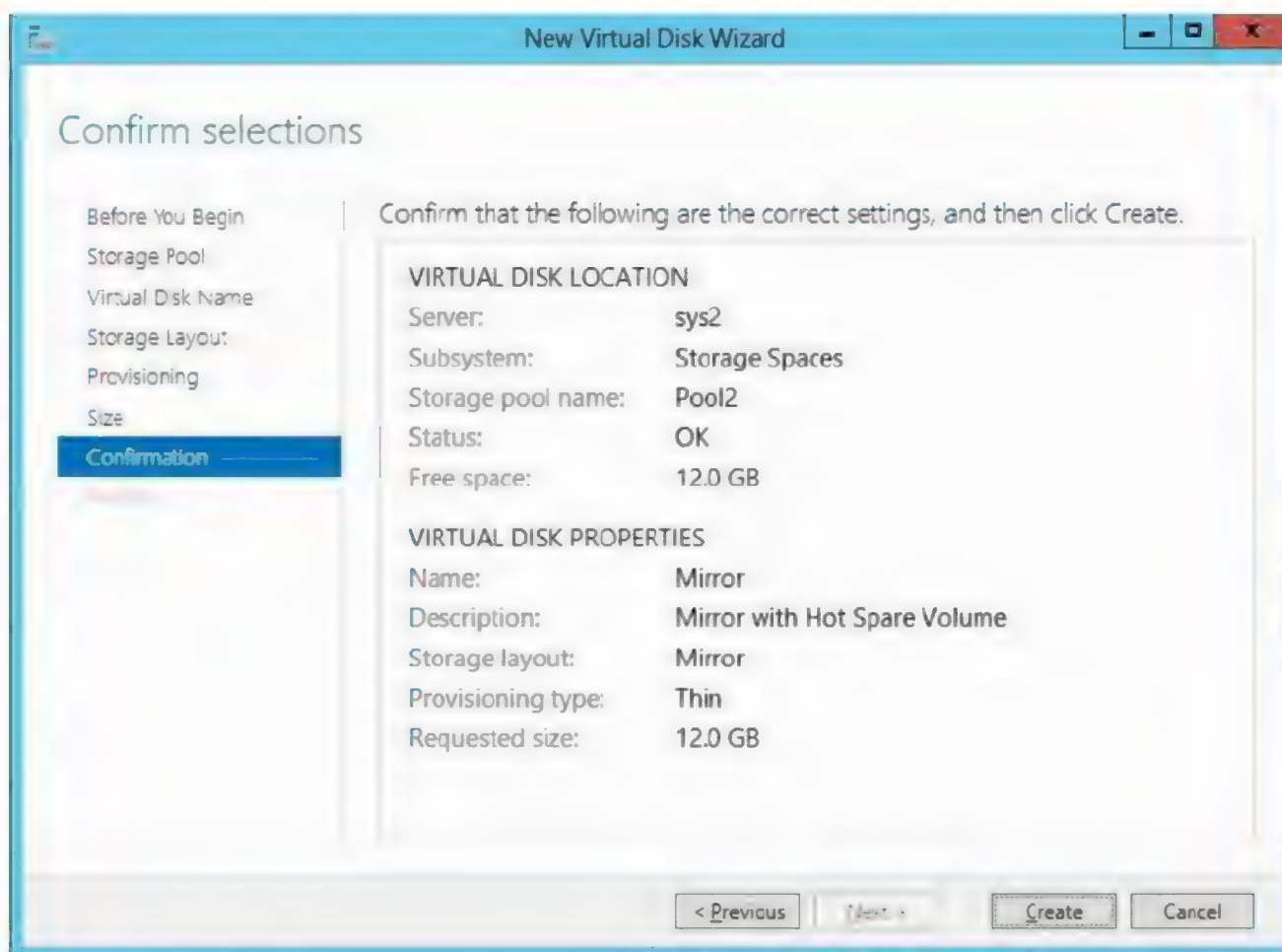
11. Select Thin or Fixed, click **Next**.

The screenshot shows the 'New Virtual Disk Wizard' window at the 'Specify the provisioning type' step. The left sidebar lists the steps: Before You Begin, Storage Pool, Virtual Disk Name, Storage Layout, Provisioning (selected), and Size. The main area is titled 'Provisioning type:' and contains two radio button options: 'Thin' (selected) and 'Fixed'. The 'Thin' option description is 'The volume uses space from the storage pool as needed, up to the volume size.' The 'Fixed' option description is 'The volume uses space from the storage pool equal to the volume size.' At the bottom, there are four buttons: '< Previous', 'Next >', 'Create', and 'Cancel'.

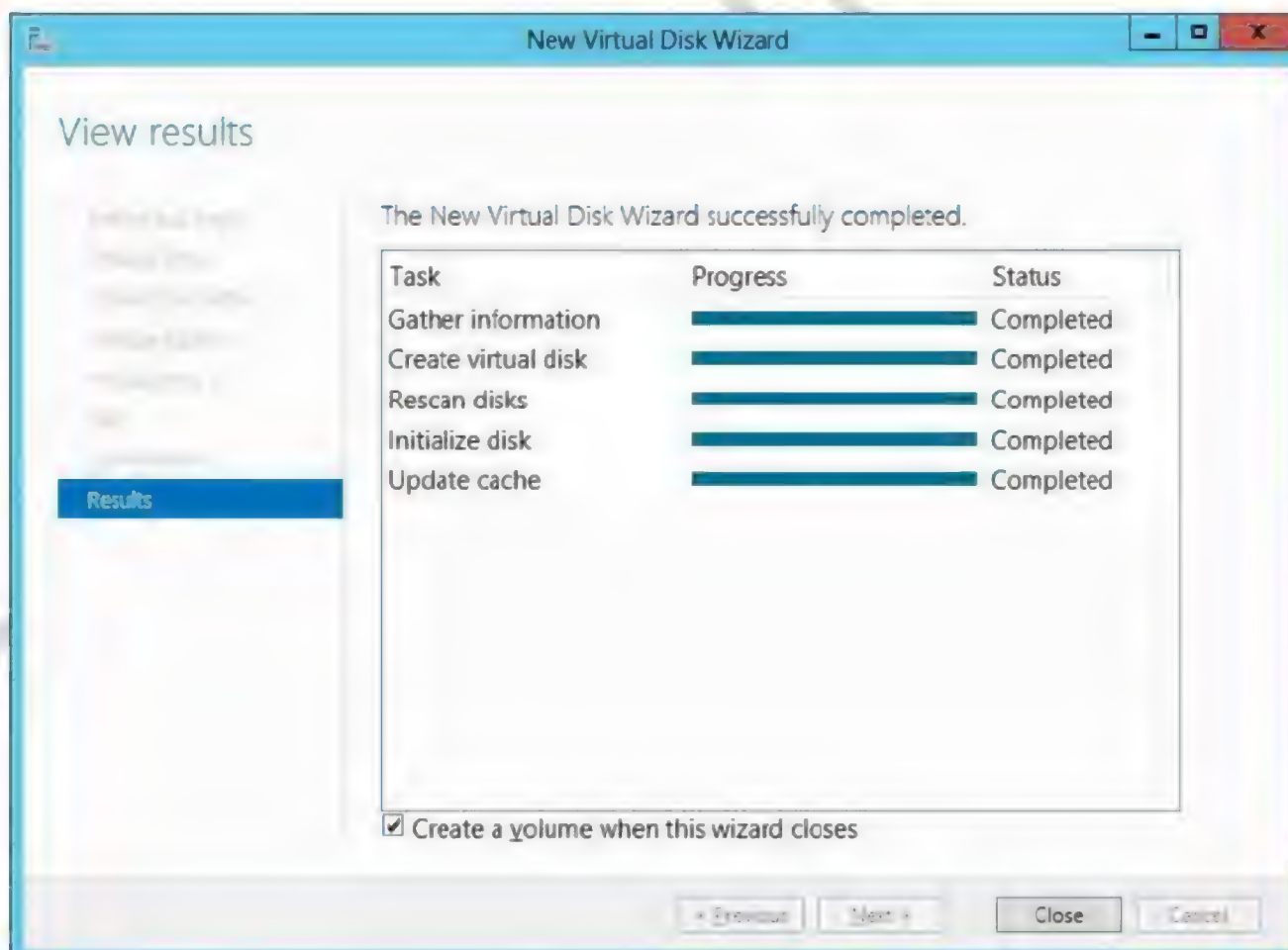
12. Enter the size of the virtual disk, click **Next**.

The screenshot shows the 'New Virtual Disk Wizard' window at the 'Specify the size of the virtual disk' step. The left sidebar lists the steps: Before You Begin, Storage Pool, Virtual Disk Name, Storage Layout, Provisioning, Size (selected), and Confirmation. The main area contains explanatory text about fixed and thin provisioning. Below the text, it shows 'Storage pool free space: 12.0 GB'. There are two radio button options: 'Specify size' (selected) and 'Create the largest virtual disk possible, up to the specified size'. Under 'Specify size', there is a text box for 'Virtual disk size' containing the number '12' and a dropdown menu set to 'GB'. At the bottom, there are four buttons: '< Previous', 'Next >', 'Create', and 'Cancel'.

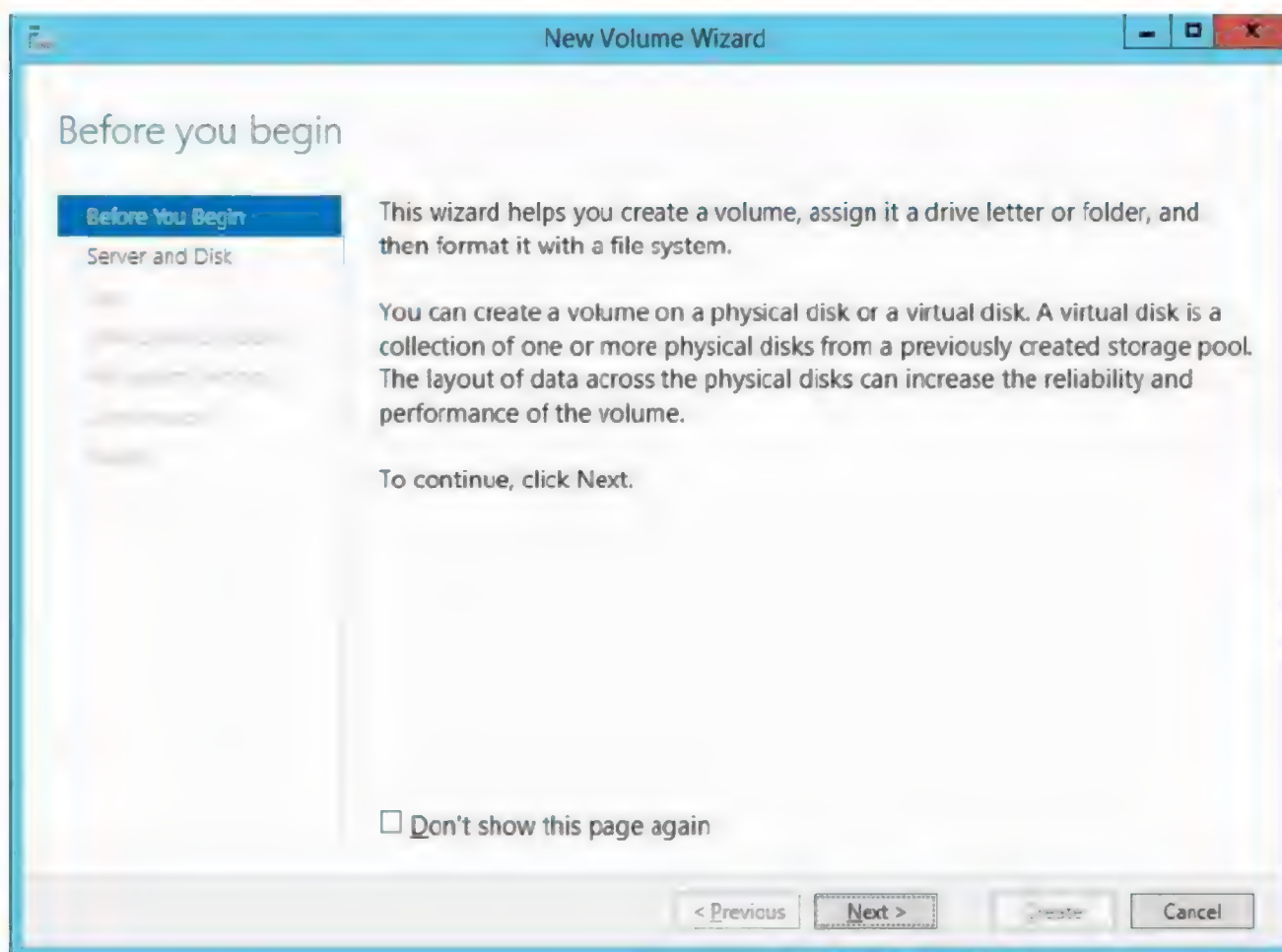
13. Click **Create**.



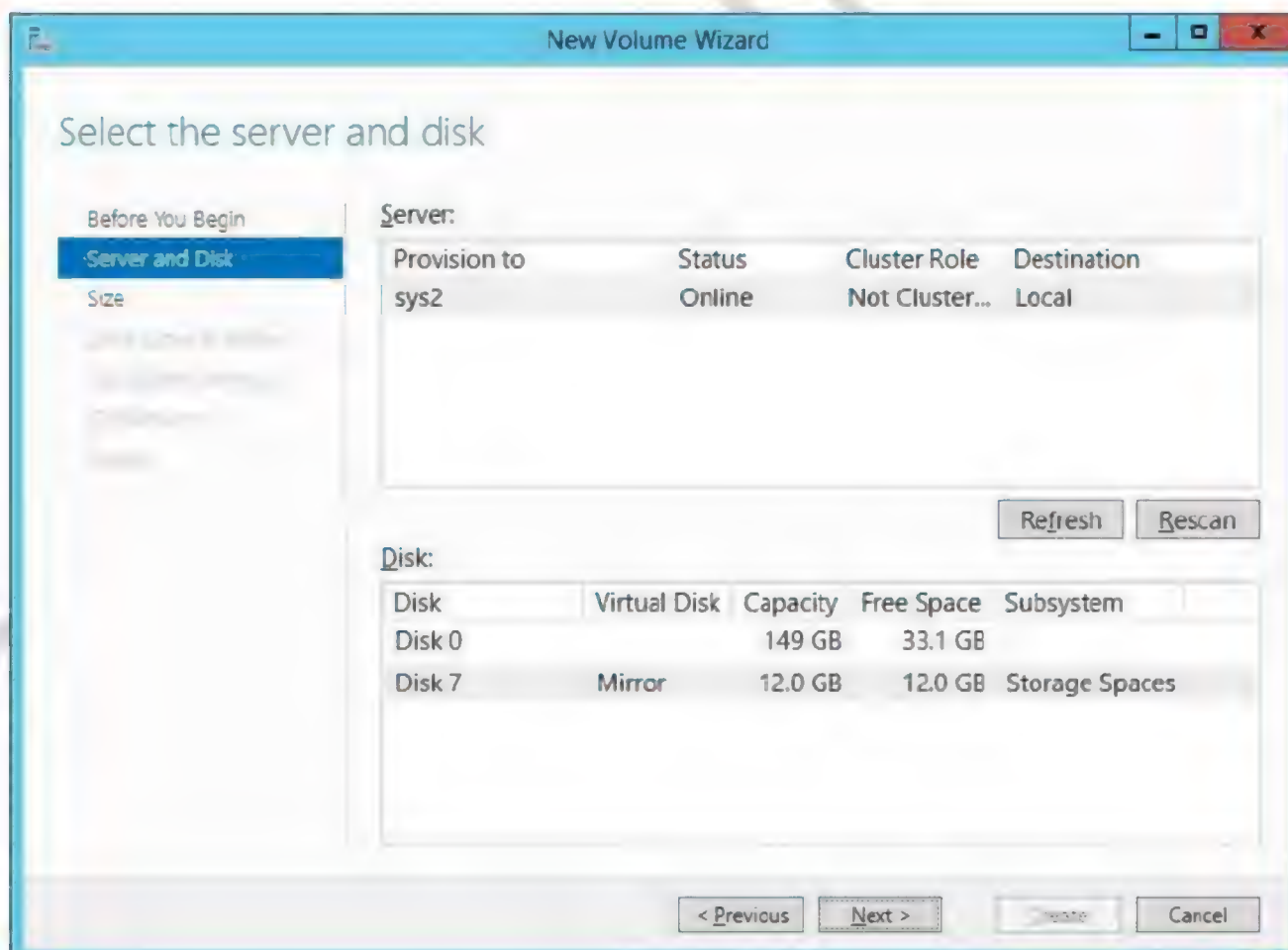
14. Click **Close**.



15. In Before you begin page, click **Next**.

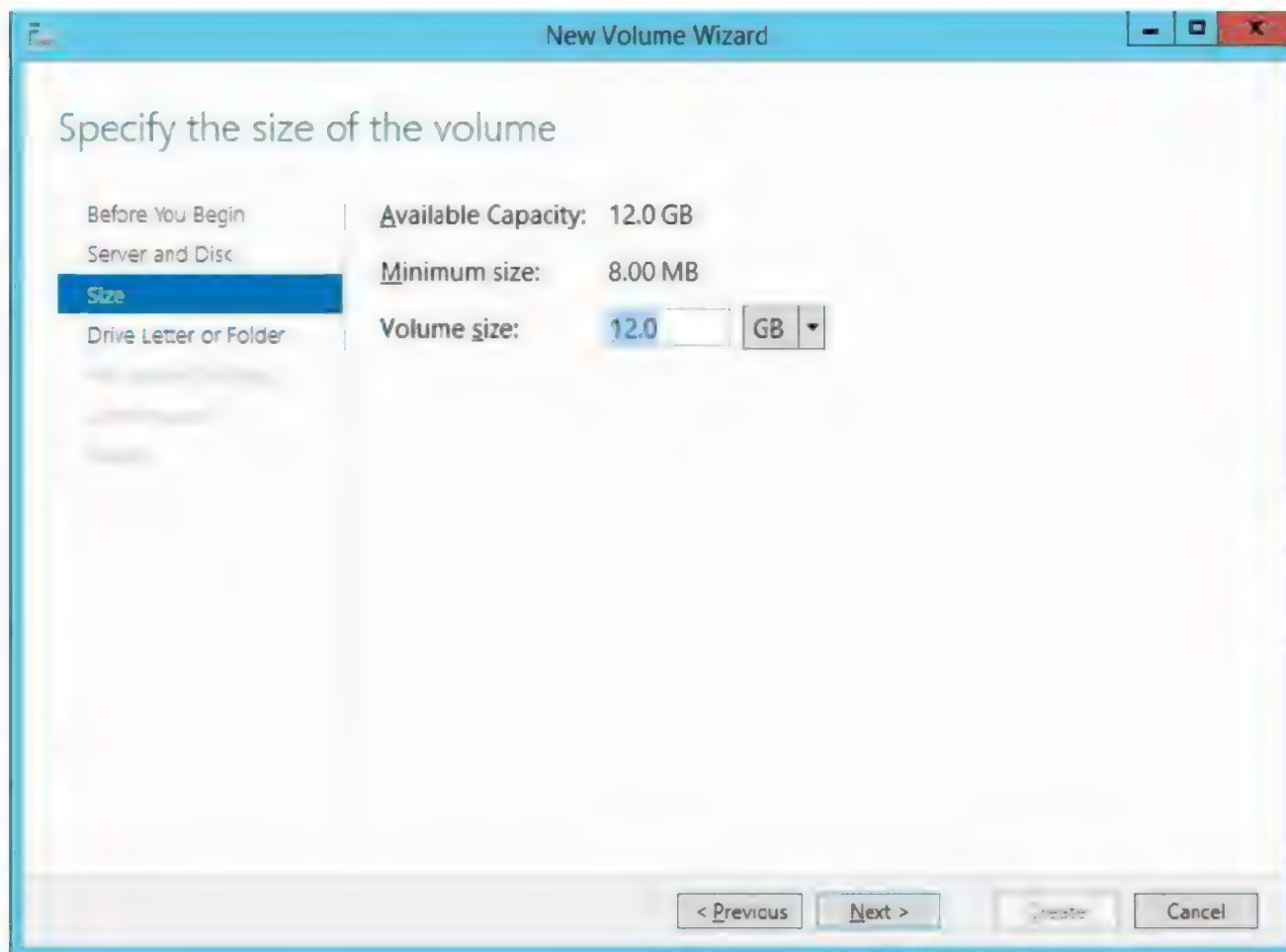


16. Select the Disk (Ex: Mirror), click **Next**.





17. Enter the size of the volume, click **Next**.

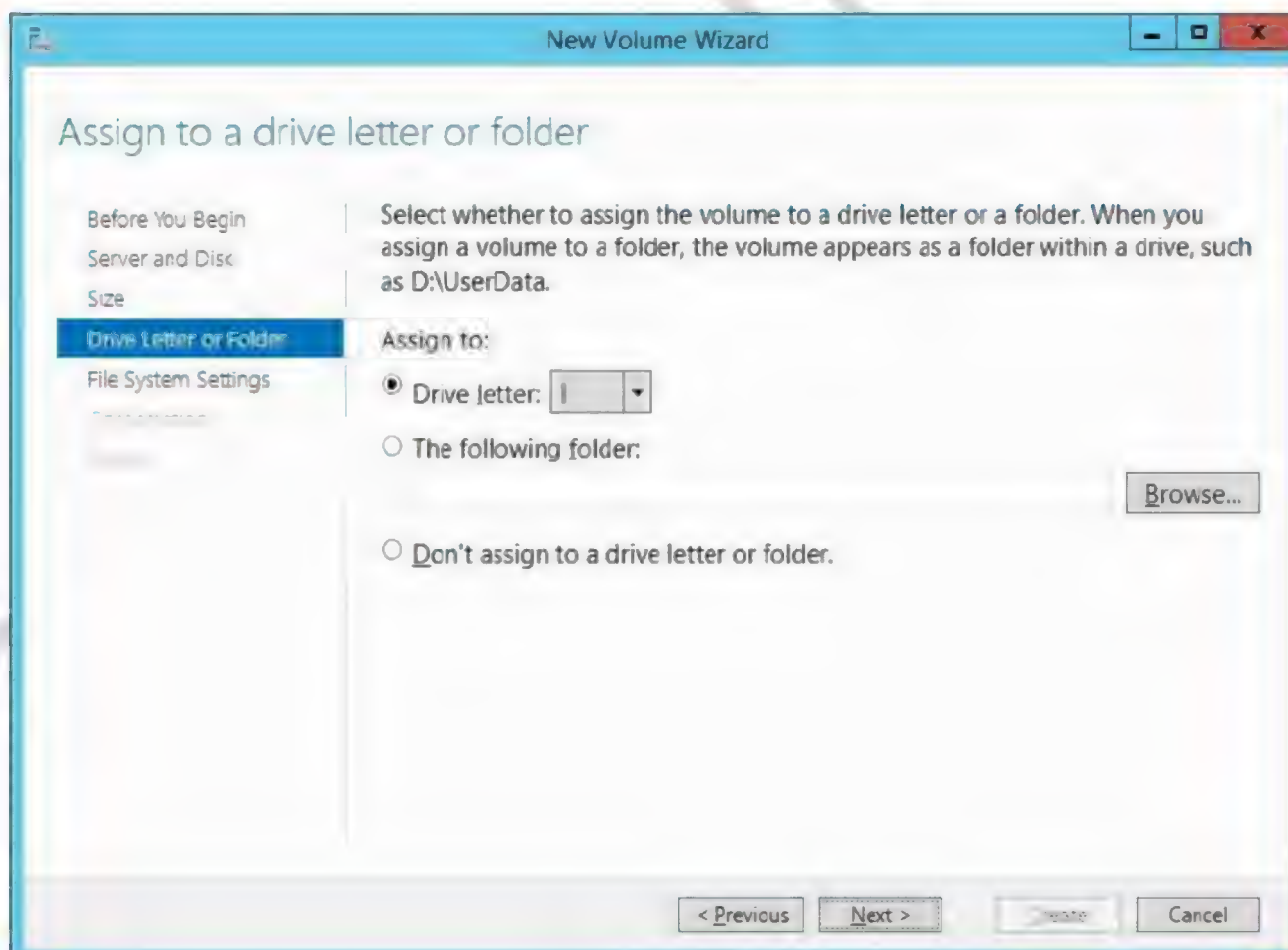


The screenshot shows the 'New Volume Wizard' window at the 'Specify the size of the volume' step. The left sidebar has four steps: 'Before You Begin', 'Server and Disk', 'Size' (which is highlighted), and 'Drive Letter or Folder'. The main area displays the following information:

- Available Capacity:** 12.0 GB
- Minimum size:** 8.00 MB
- Volume size:** 12.0 GB (The '12.0' is in a text box, and 'GB' is in a dropdown menu)

At the bottom, there are four buttons: '< Previous', 'Next >', 'Create', and 'Cancel'.

18. Select the Drive letter, click **Next**.



The screenshot shows the 'New Volume Wizard' window at the 'Assign to a drive letter or folder' step. The left sidebar has five steps: 'Before You Begin', 'Server and Disk', 'Size', 'Drive Letter or Folder' (which is highlighted), and 'File System Settings'. The main area contains the following text and options:

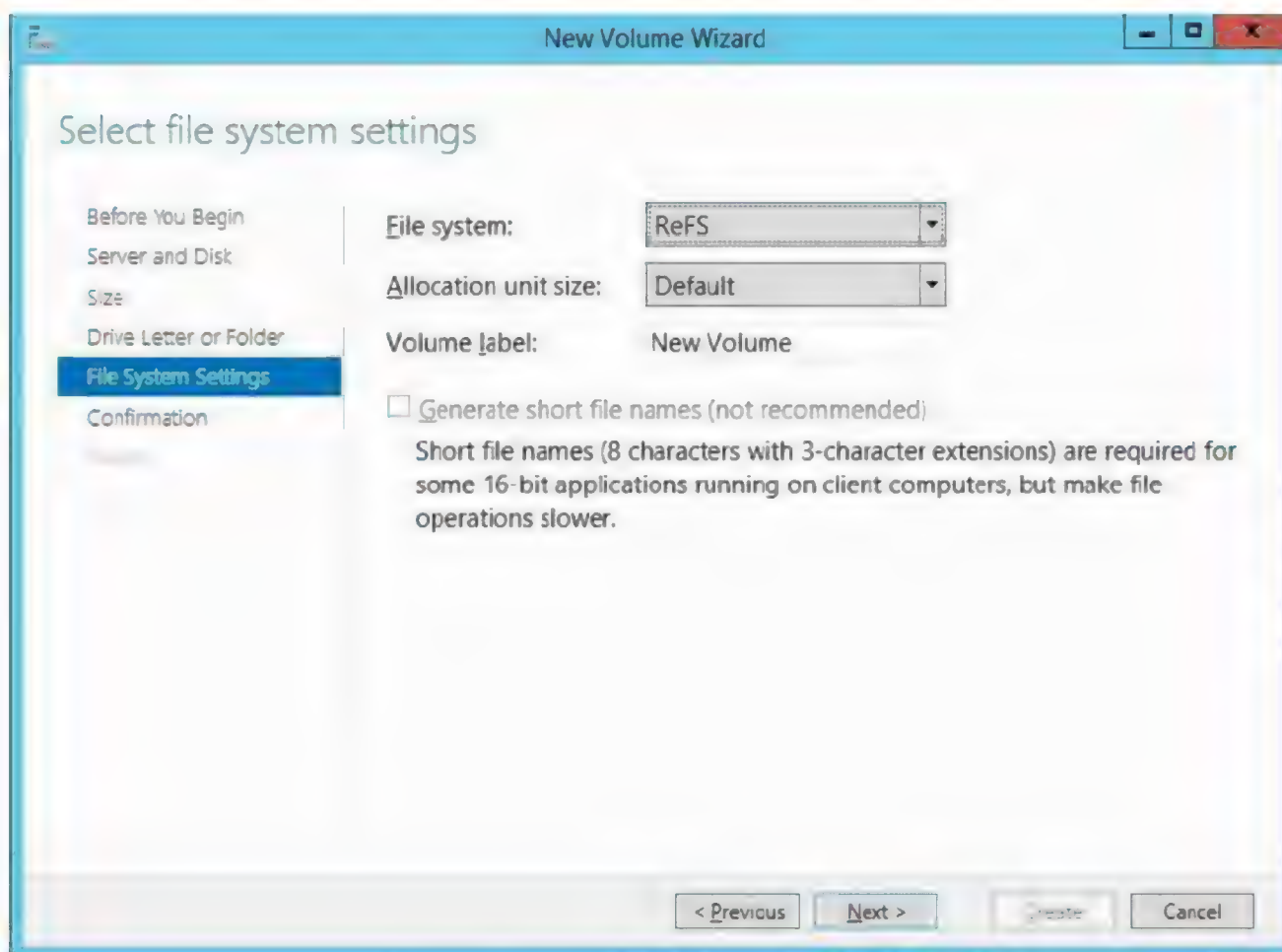
Select whether to assign the volume to a drive letter or a folder. When you assign a volume to a folder, the volume appears as a folder within a drive, such as D:\UserData.

**Assign to:**

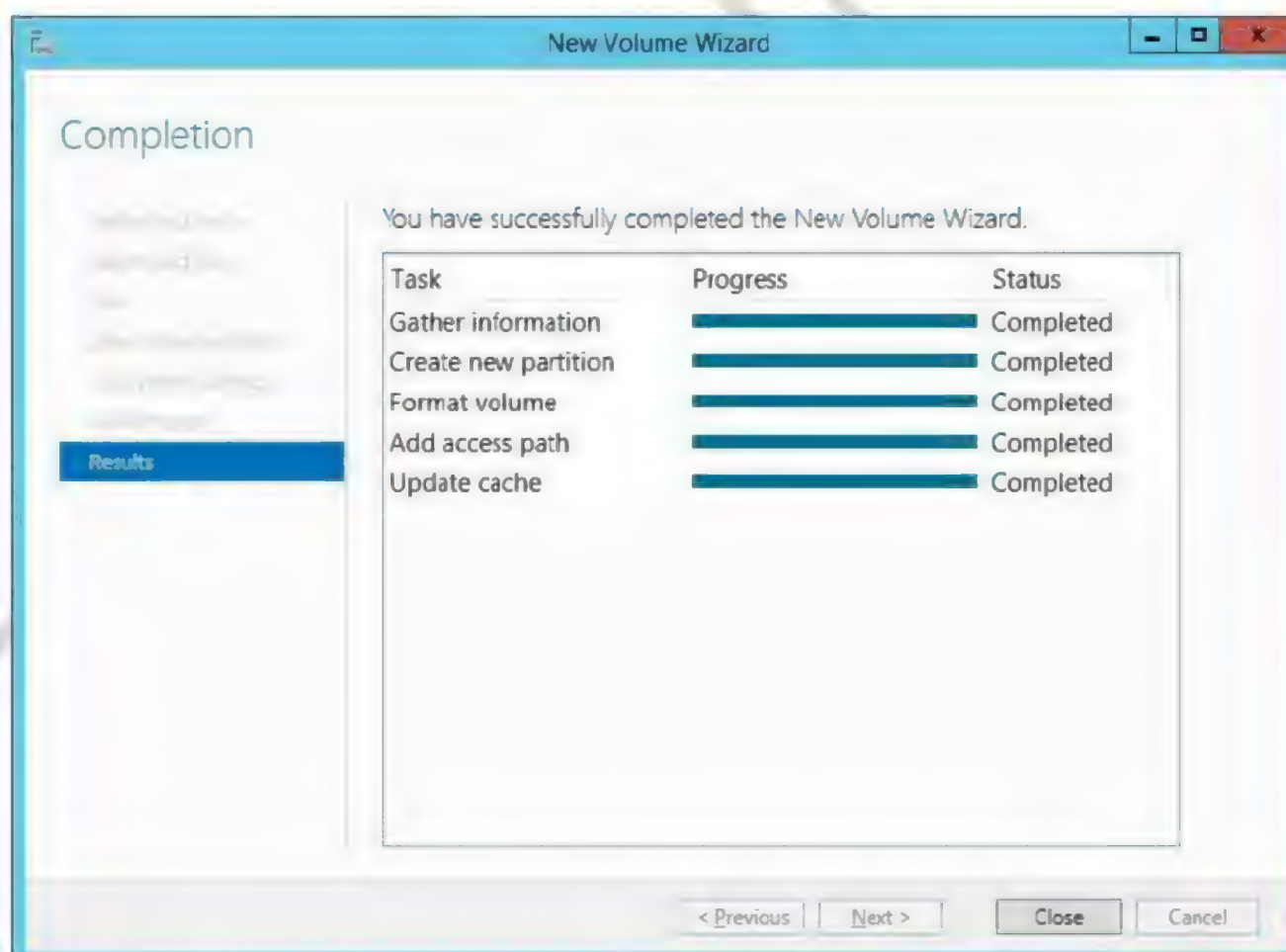
- ☒ Drive letter: I (The letter 'I' is in a dropdown menu)
- ☐ The following folder: Browse...
- ☐ Don't assign to a drive letter or folder.

At the bottom, there are four buttons: '< Previous', 'Next >', 'Create', and 'Cancel'.

19. Select the File system, click **Next**.

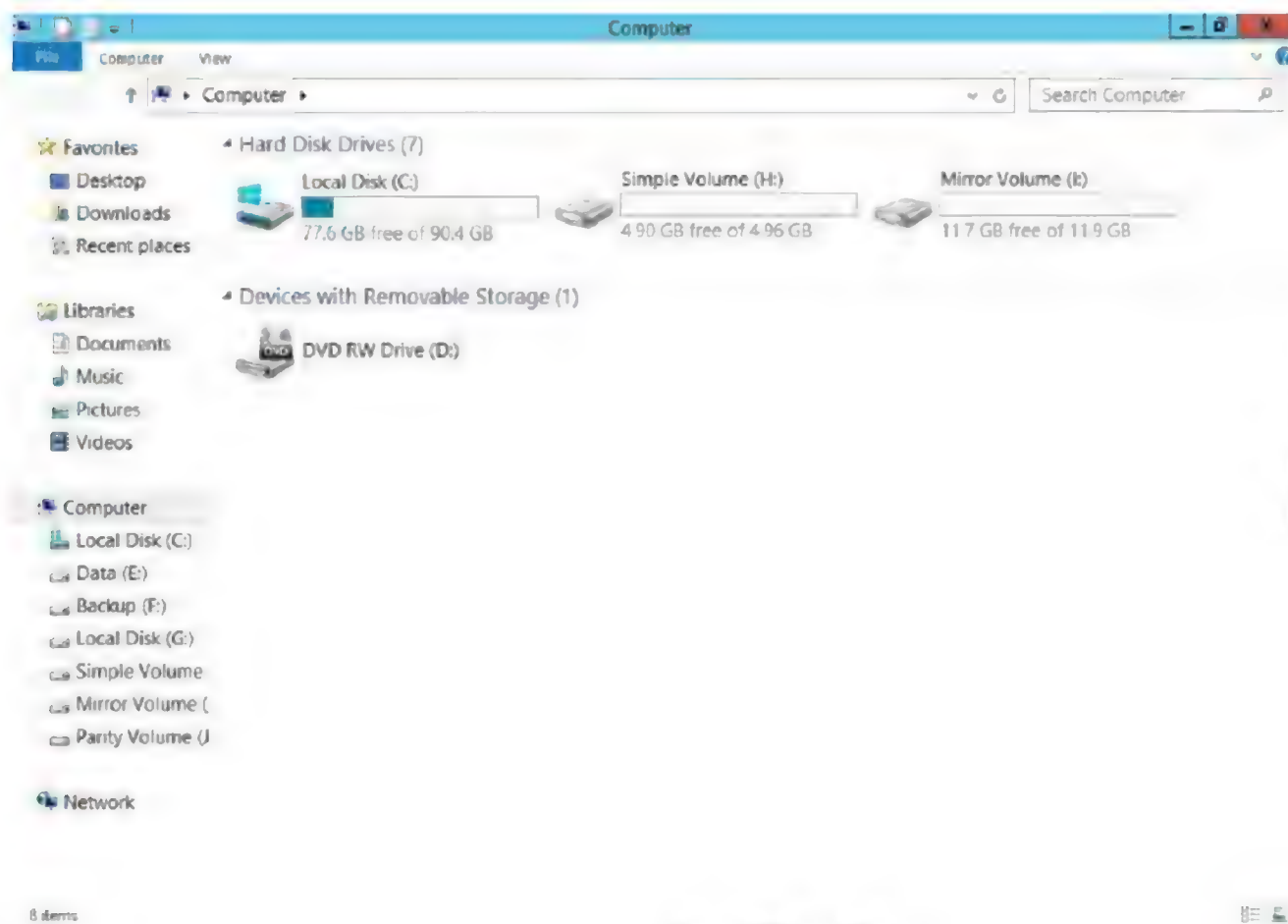


20. Click Create, click **Close**.



## Verification

1. Go to Start, select Computer Icon and verify for the Mirror volume.





## Lab – 80: Creating Parity (RAID-5)

### Objective:

To configure RAID-5 volume for fault tolerance.

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server or Domain Controller.
- A member server running windows sever 2012 or client running windows 7.

### Topology:



MICROSOFT.COM

#### SYS1

##### Domain Controller / Terminal Server

IP Address      10.0.0.1  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

#### SYS2

##### Member Server / Client

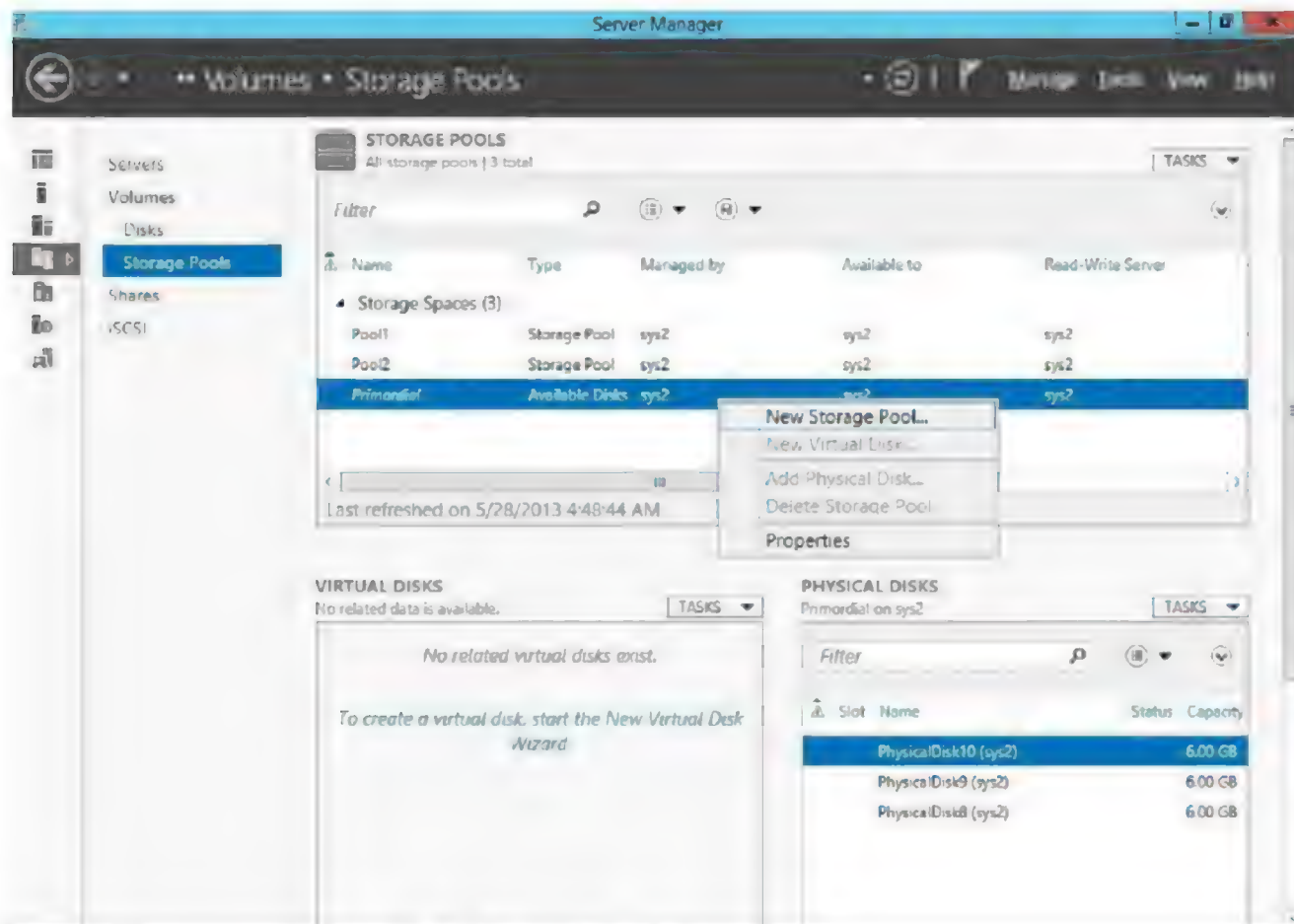
IP Address      10.0.0.2  
Subnet Mask    255.0.0.0  
Preferred DNS   10.0.0.1

## SYS1 – CONFIGURATION

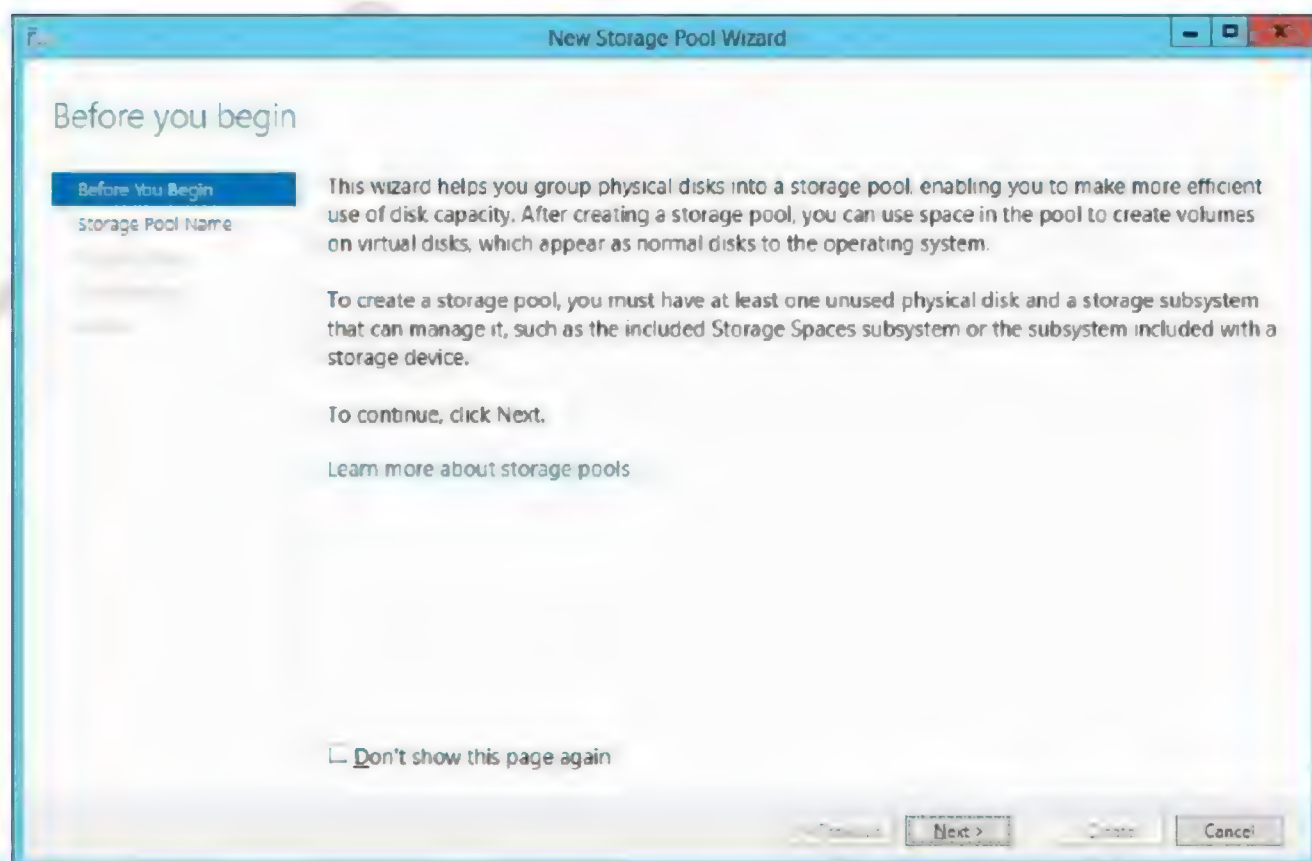
1. Create multiple iSCSI Virtual Disk (Ex: Vdisk7, Vdisk8, Vdisk9...)

## SYS2 – CONFIGURATION

1. Go to Server Manager → File and Storage Services → Storage Pools → right click Primordial storage pool → select **New Storage Pool**



2. In Before you begin page, click **Next**.



3. Enter Name (Ex: Pool3), click **Next**.

**New Storage Pool Wizard**

Specify a storage pool name and subsystem

Before You Begin  
Storage Pool Name  
Physical Disks

Name: Pool3  
Description: Parity

Select the group of available disks (also known as a primordial pool) that you want to use:

Managed by	Available to	Subsystem	Primordial Pool
sys2	sys2	Storage Spaces	Primordial

< Previous   Next >   Create   Cancel

4. Check the boxes, to select the physical disks for the storage pool, click **Next**.

**New Storage Pool Wizard**

Select physical disks for the storage pool

Before You Begin  
Storage Pool Name  
Physical Disks  
Confirmation

Select physical disks for the storage pool, and choose whether any disks should be allocated as hot spares that replace failed disks.

Physical disks:

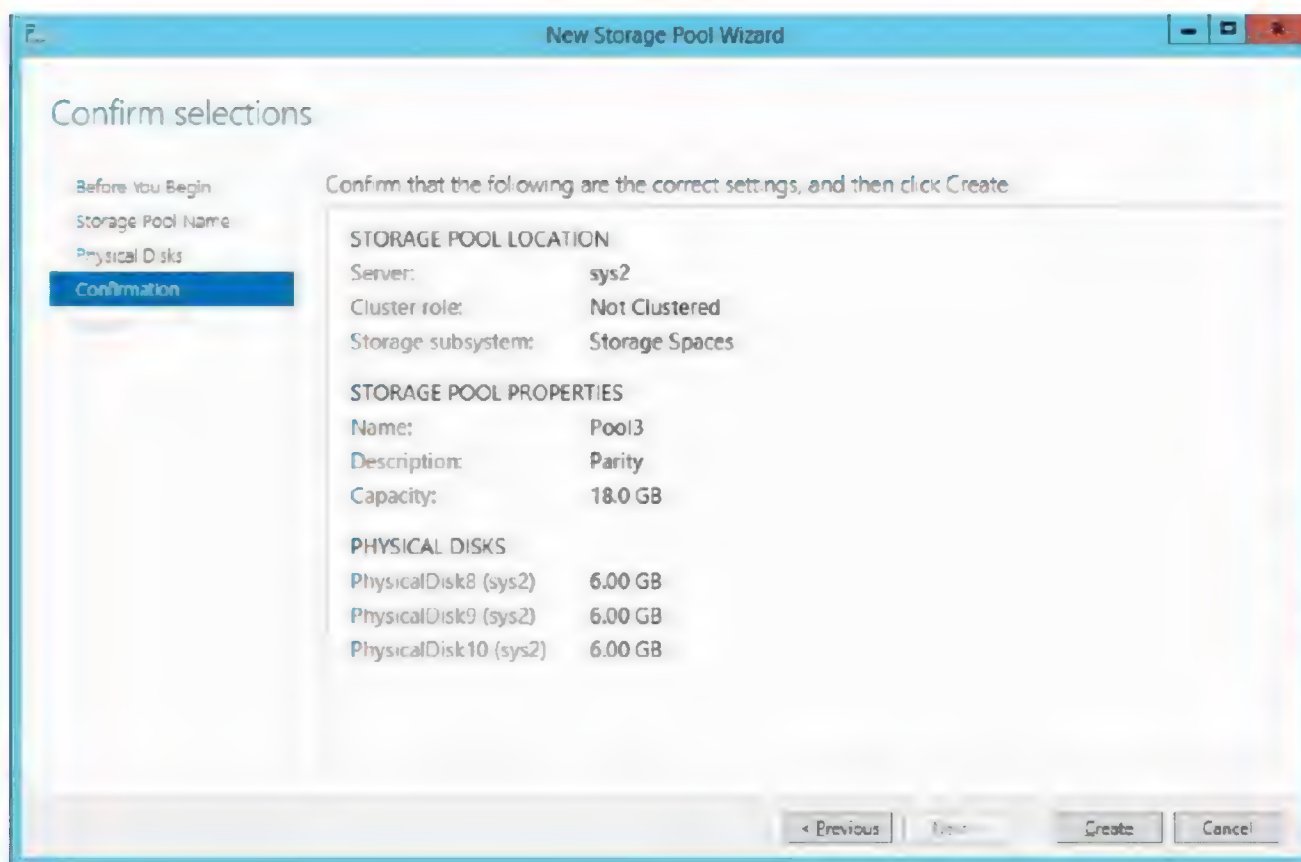
<input checked="" type="checkbox"/>	Slot	Name	Capacity	Bus	RPM	Model	Allocation	Chassis
<input checked="" type="checkbox"/>		PhysicalDis...	6.00 GB	iSCSI		Virtual HD	Automatic	
<input checked="" type="checkbox"/>		PhysicalDis...	6.00 GB	iSCSI		Virtual HD	Automatic	
<input checked="" type="checkbox"/>		PhysicalDis...	6.00 GB	iSCSI		Virtual HD	Automatic	

Total selected capacity: 18.0 GB  
 ⓘ Selecting these disks will create a local pool.

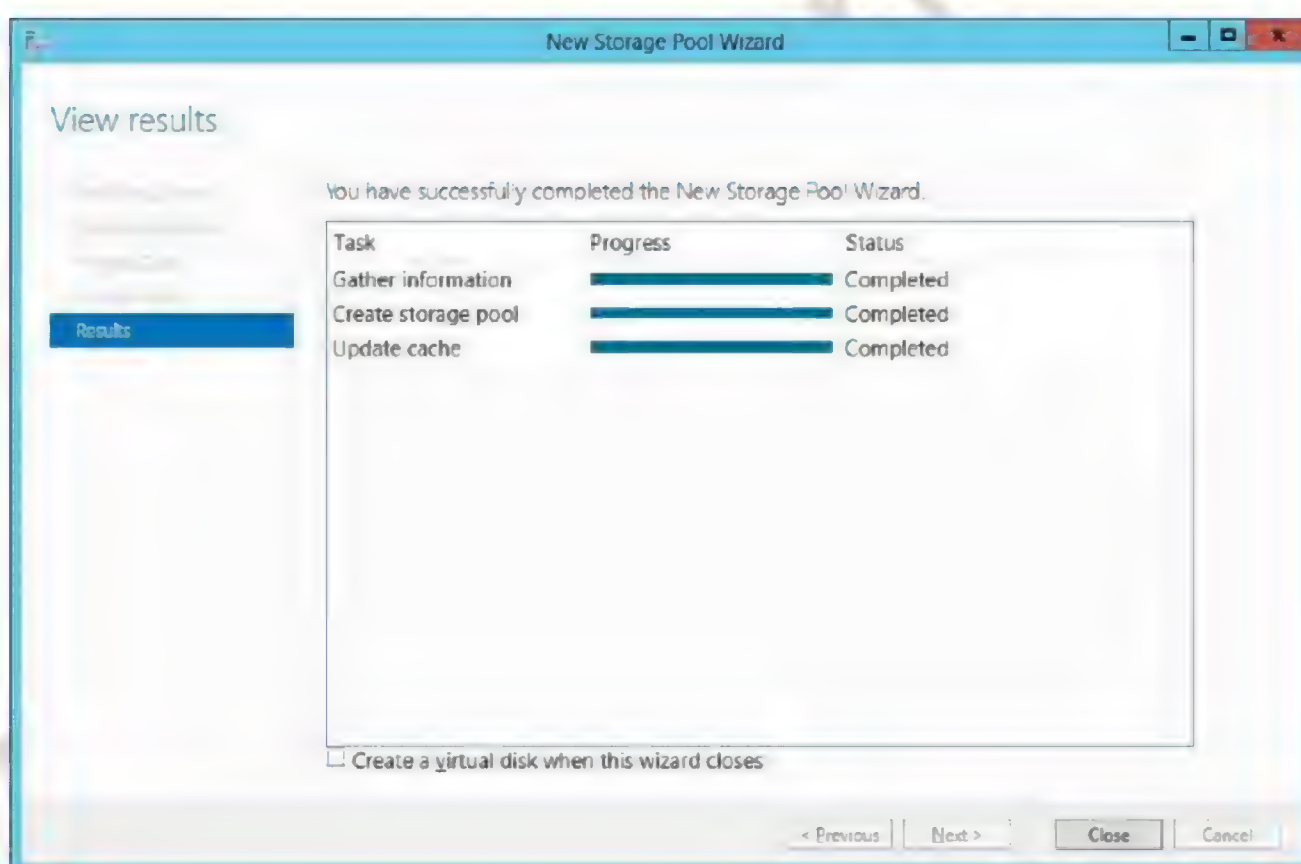
< Previous   Next >   Create   Cancel



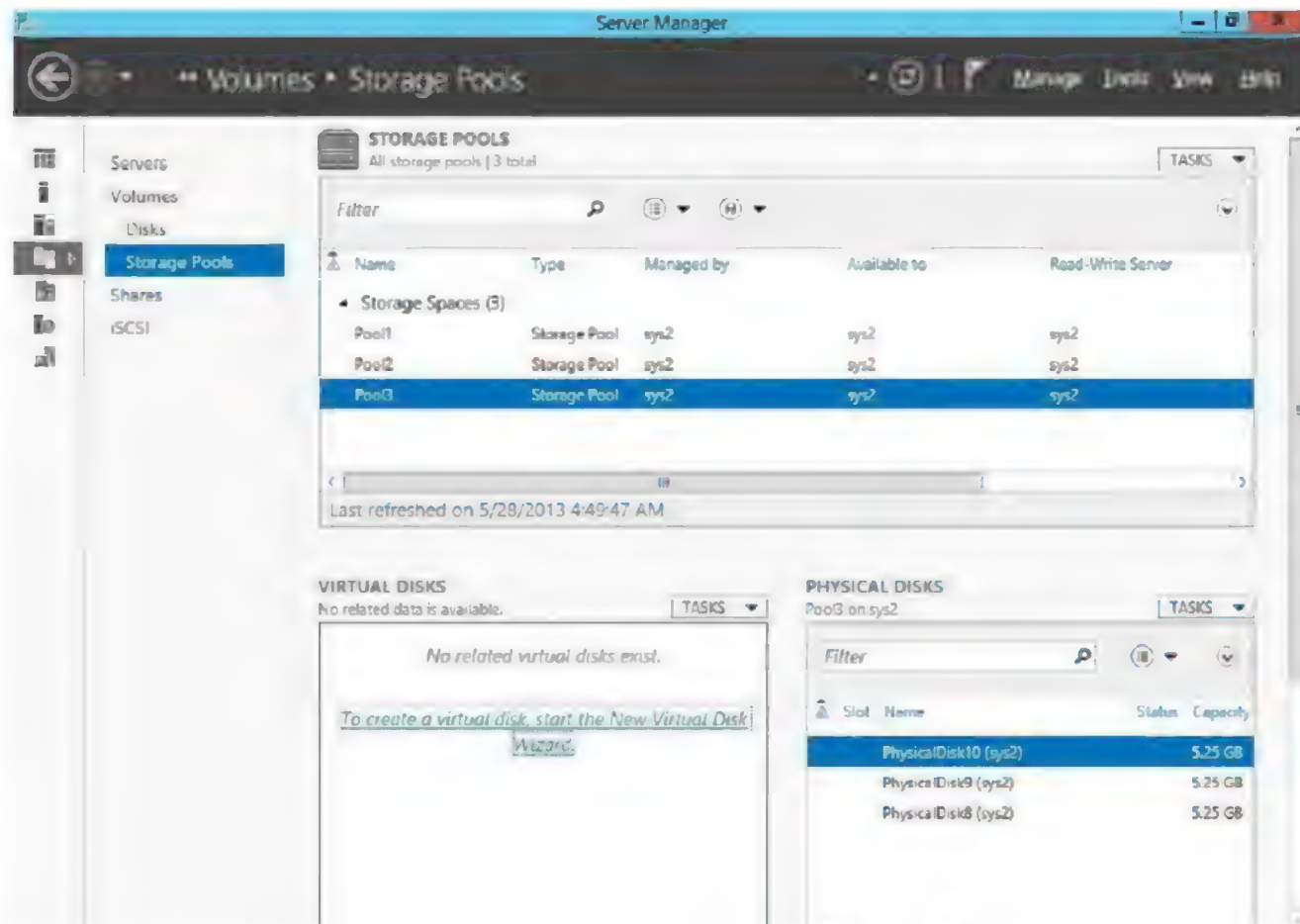
- Click **Create**.



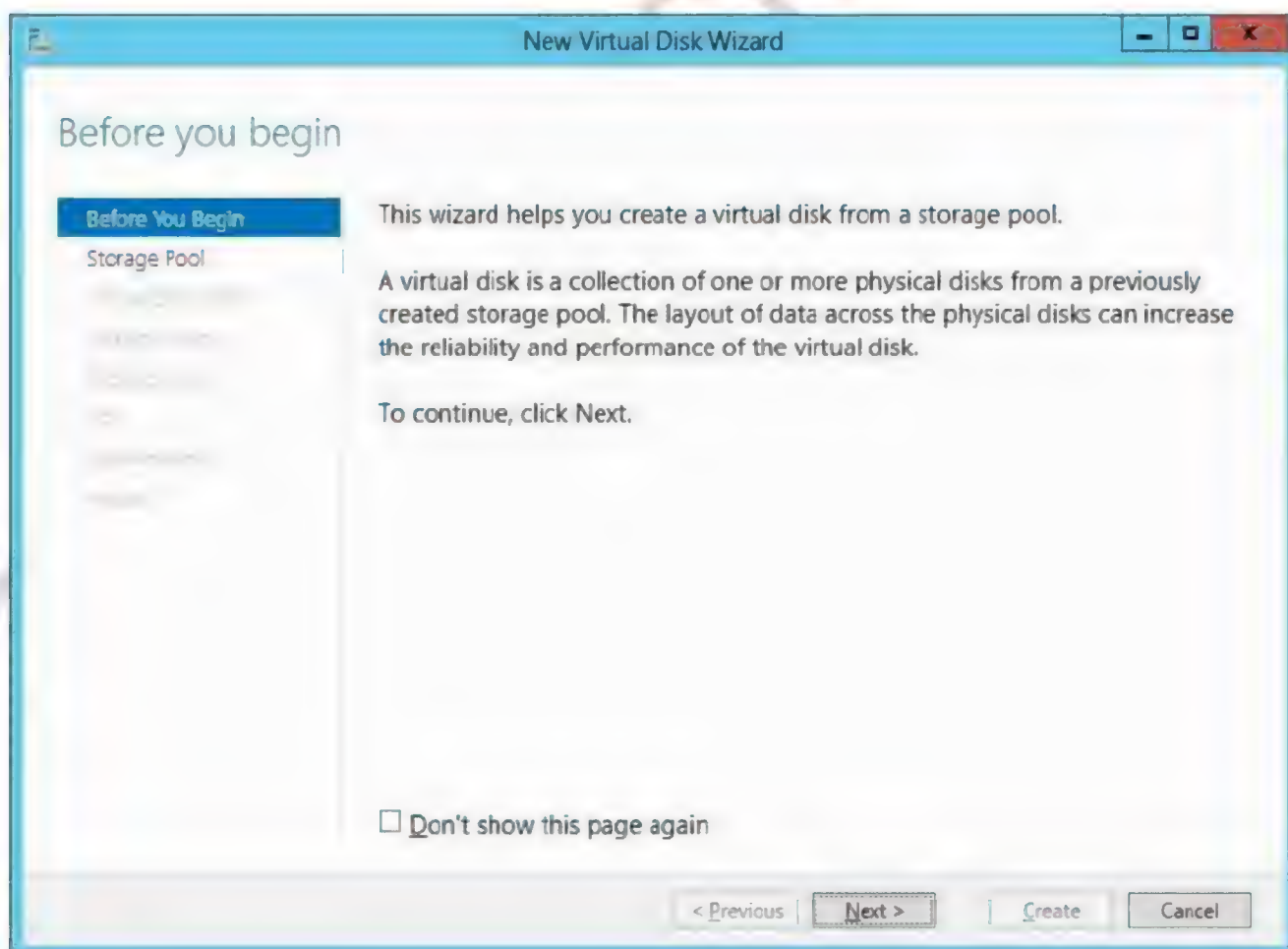
- Click **Close**.



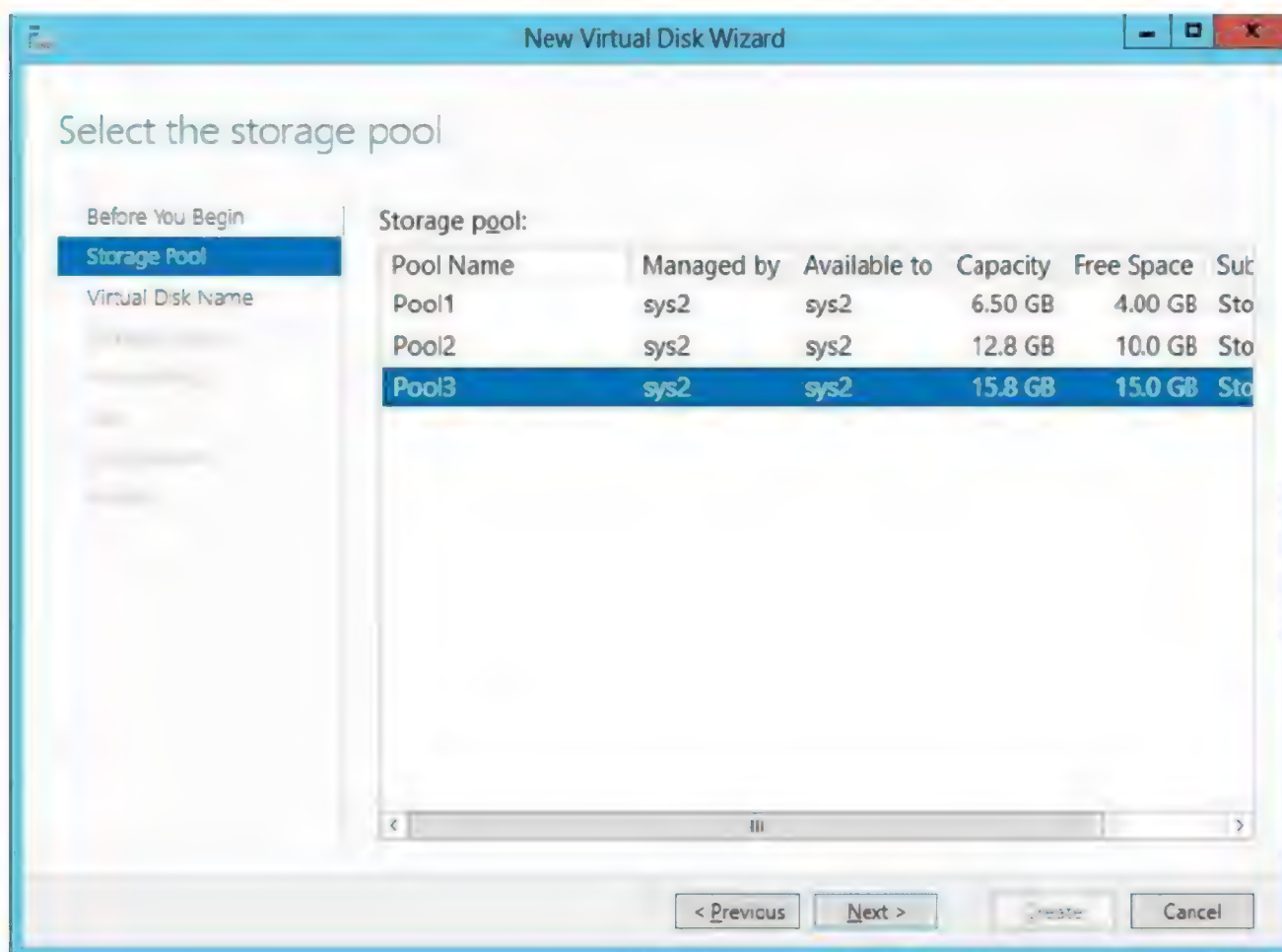
7. In Server Manager, Storage Pools, select Pool3, and click **To create a virtual disk, start the New Virtual Disk Wizard.**



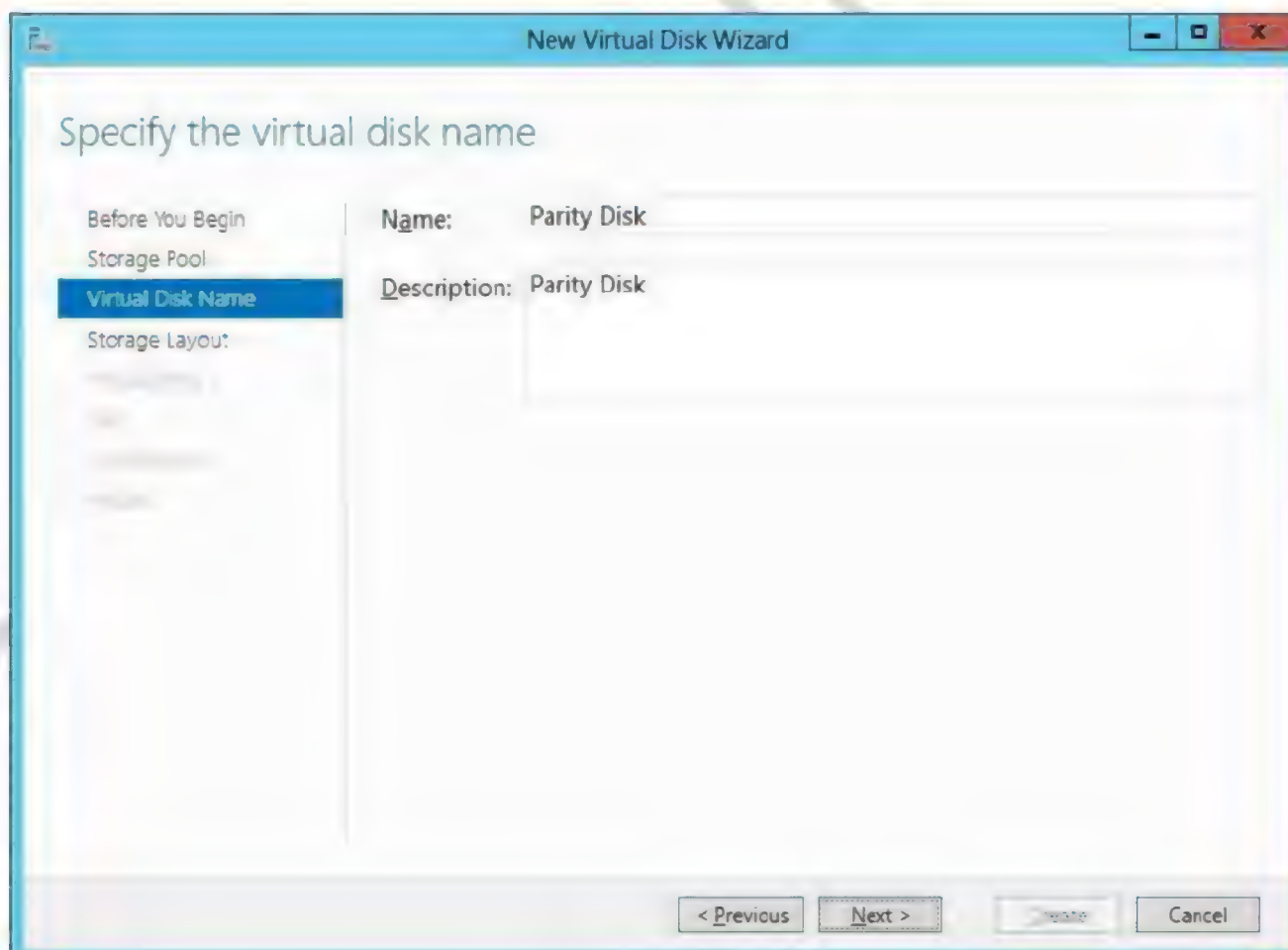
8. In Before you begin page, click **Next.**



9. Select storage pool (Ex: Pool3), click **Next**.

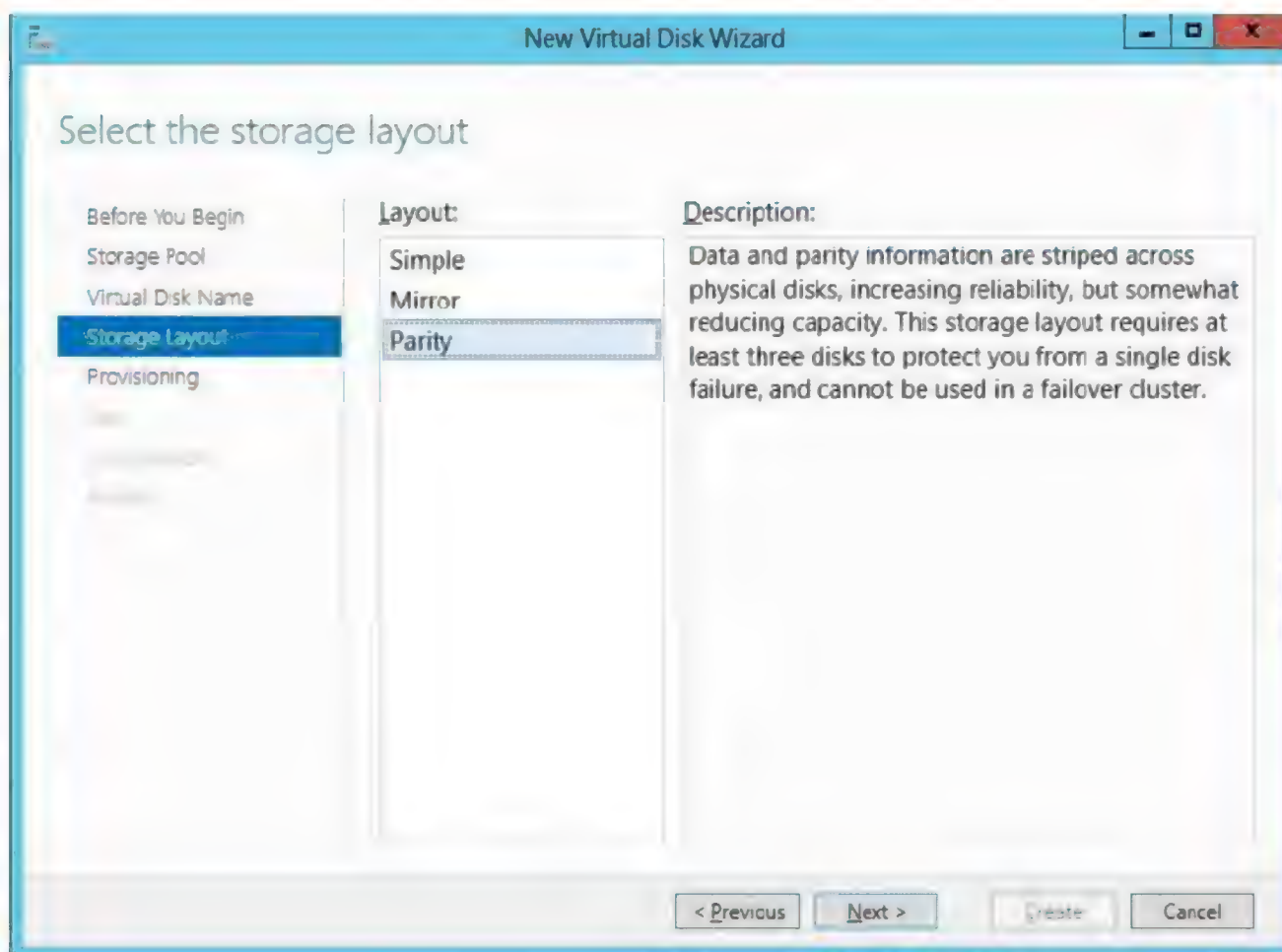


10. Enter Name (Ex: Parity Disk), click **Next**.

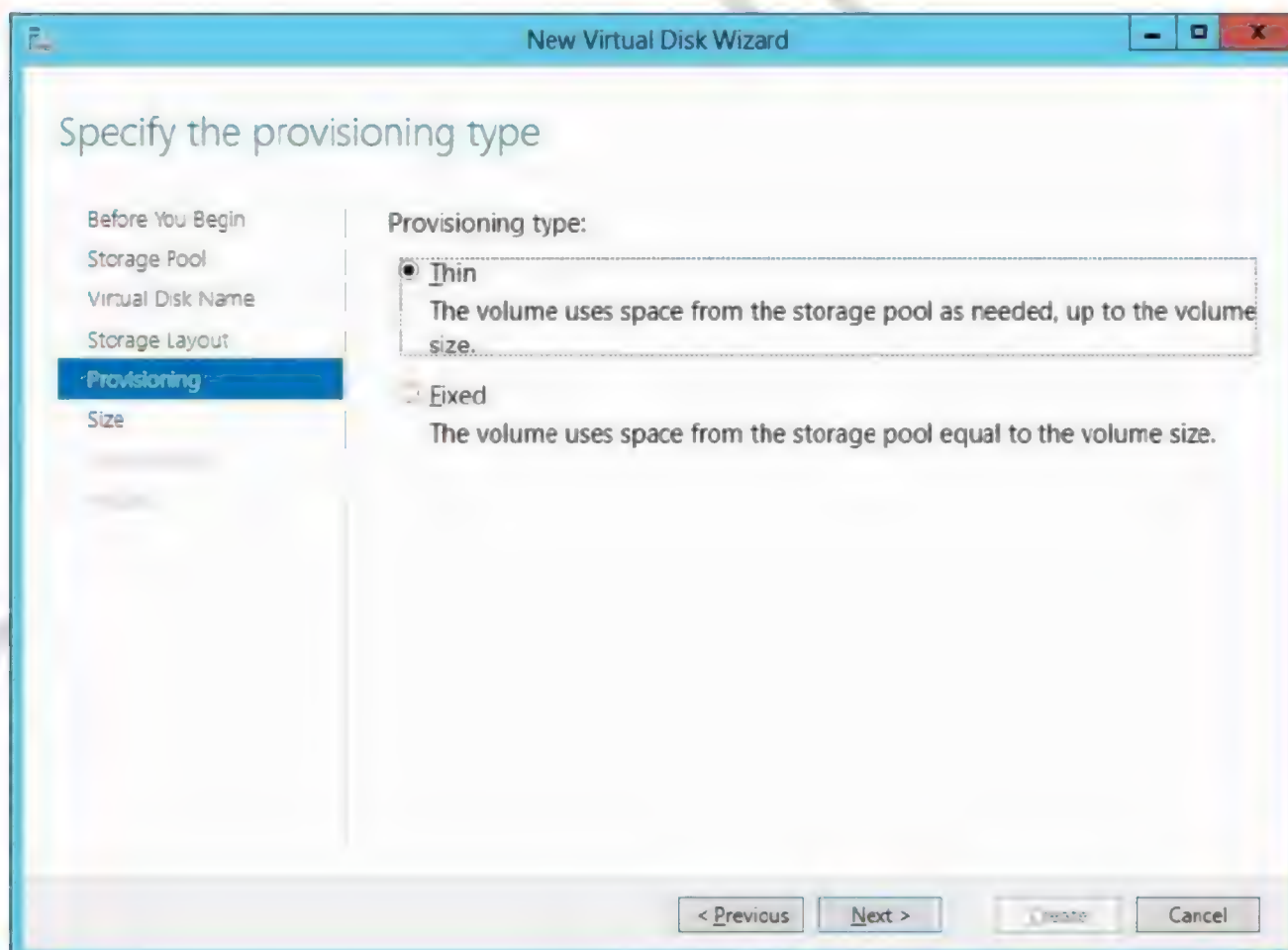




11. In Layout, select Parity, click **Next**.



12. Select Thin or Fixed, click **Next**.



13. Enter the size of the virtual disk, click **Next**.

**New Virtual Disk Wizard**

Specify the size of the virtual disk

Before You Begin  
Storage Pool  
Virtual Disk Name  
Storage Layout:  
Provisioning  
**Size**  
Confirmation

When using fixed provisioning and storage layouts other than simple stripe sets, the virtual disk consumes more free space than the size you specify. By default, Windows creates the virtual disk only if there is sufficient free space. When using thin provisioning, you can create a virtual disk larger than the amount of free space in the storage pool.

Storage pool free space: 15.0 GB

☒ Specify size  
Virtual disk size: 15 GB

☐ Create the largest virtual disk possible, up to the specified size

Maximum size

< Previous Next > Create Cancel

14. Click **Create**.

**New Virtual Disk Wizard**

Confirm selections

Before You Begin  
Storage Pool  
Virtual Disk Name  
Storage Layout:  
Provisioning  
Size  
**Confirmation**

Confirm that the following are the correct settings, and then click Create.

**VIRTUAL DISK LOCATION**

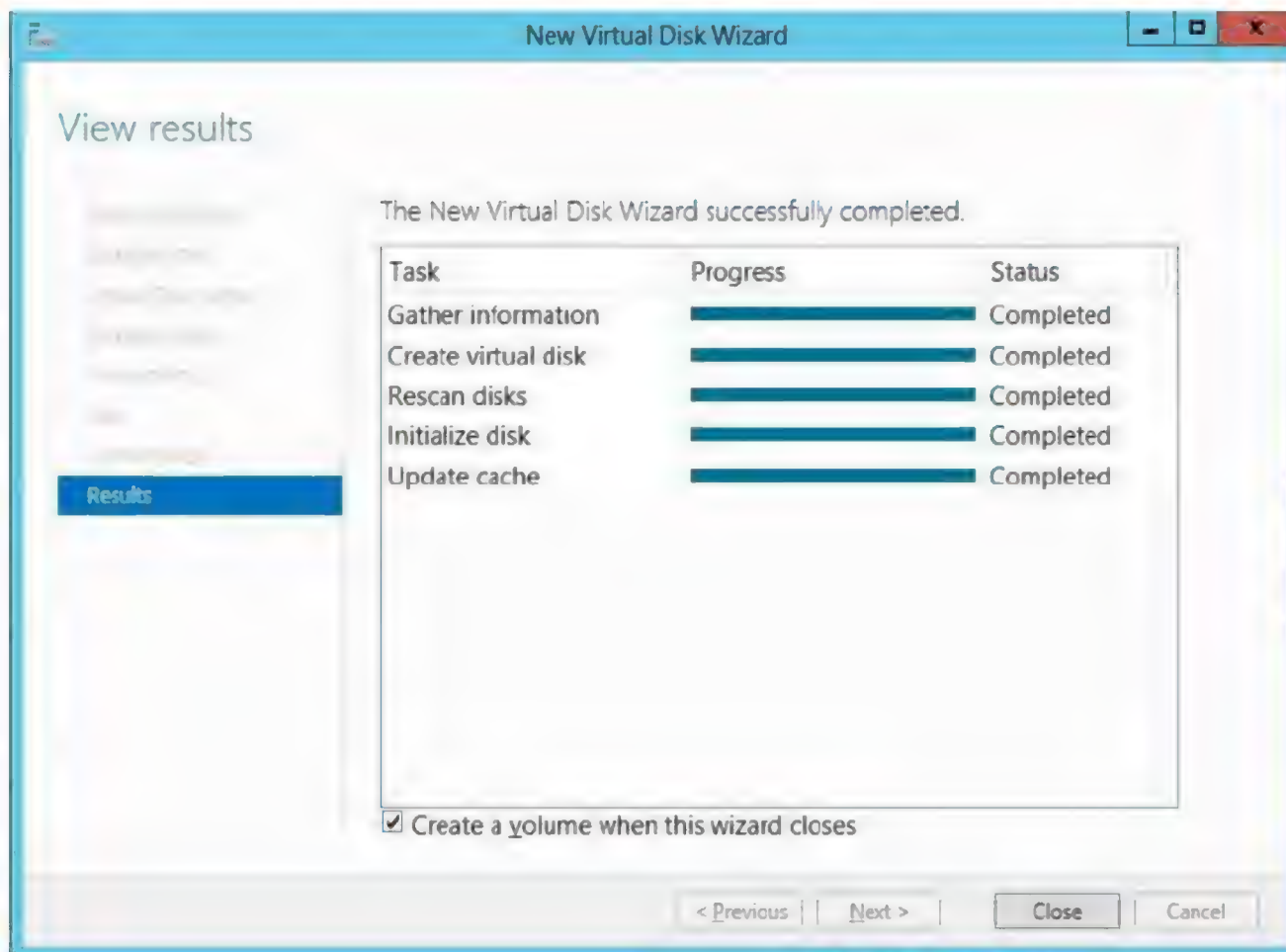
Server:	sys2
Subsystem:	Storage Spaces
Storage pool name:	Pool3
Status:	OK
Free space:	15.0 GB

**VIRTUAL DISK PROPERTIES**

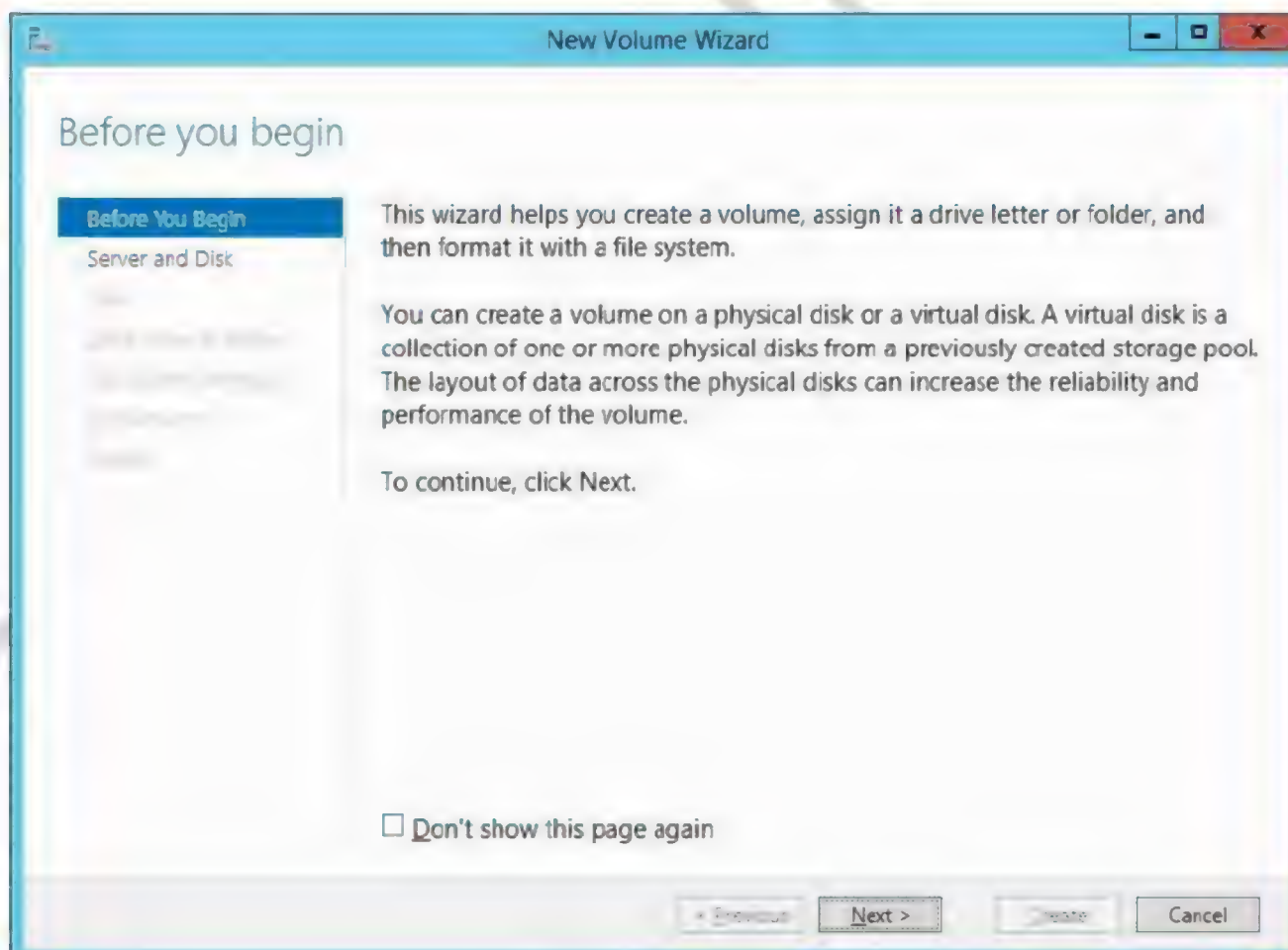
Name:	Parity Disk
Description:	Parity Disk
Storage layout:	Parity
Provisioning type:	Thin
Requested size:	15.0 GB

< Previous Next > Create Cancel

15. Click **Close**, verify for the check box Create a volume when this wizard closes.

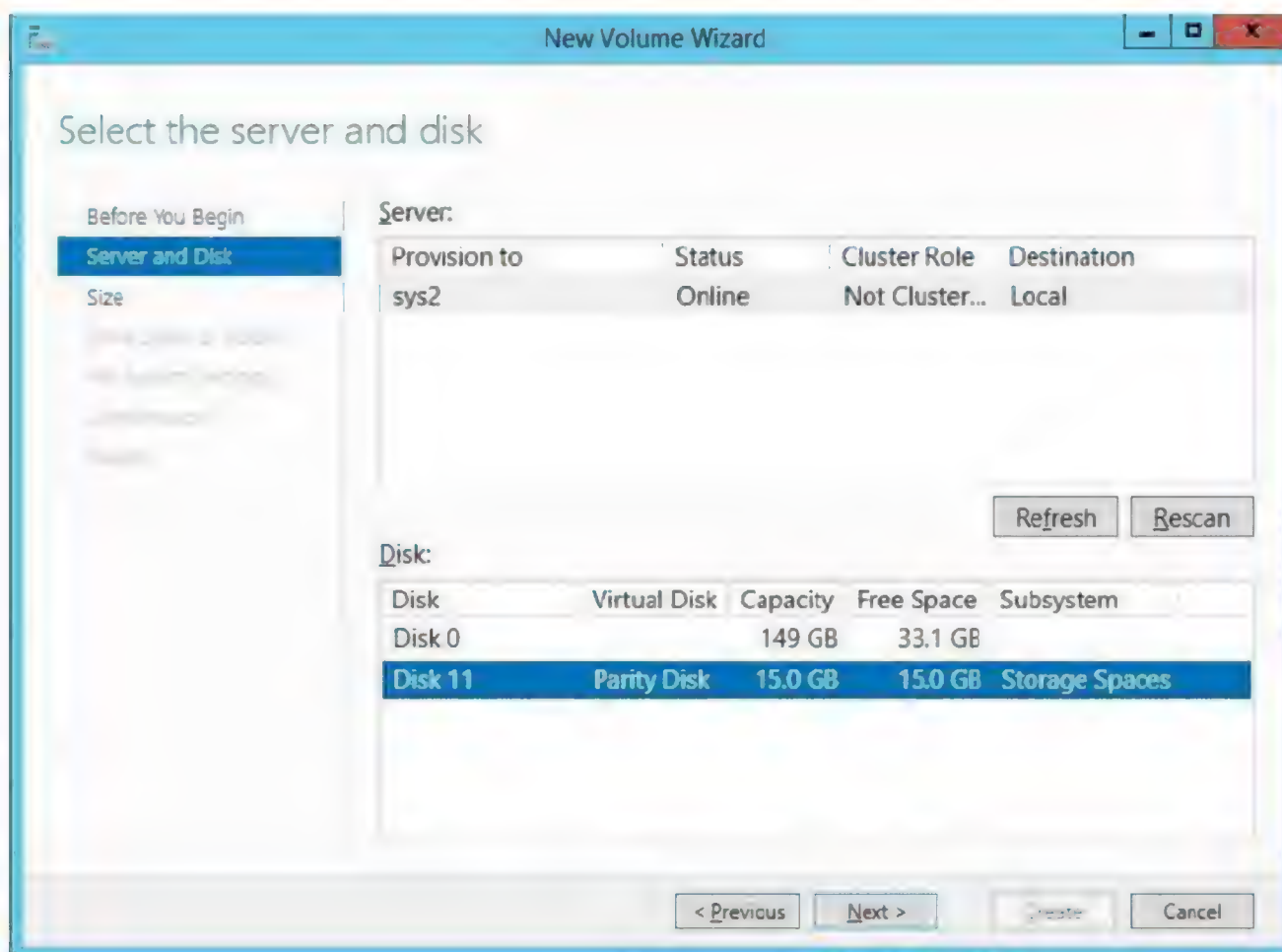


16. In Before you begin page, click **Next**.

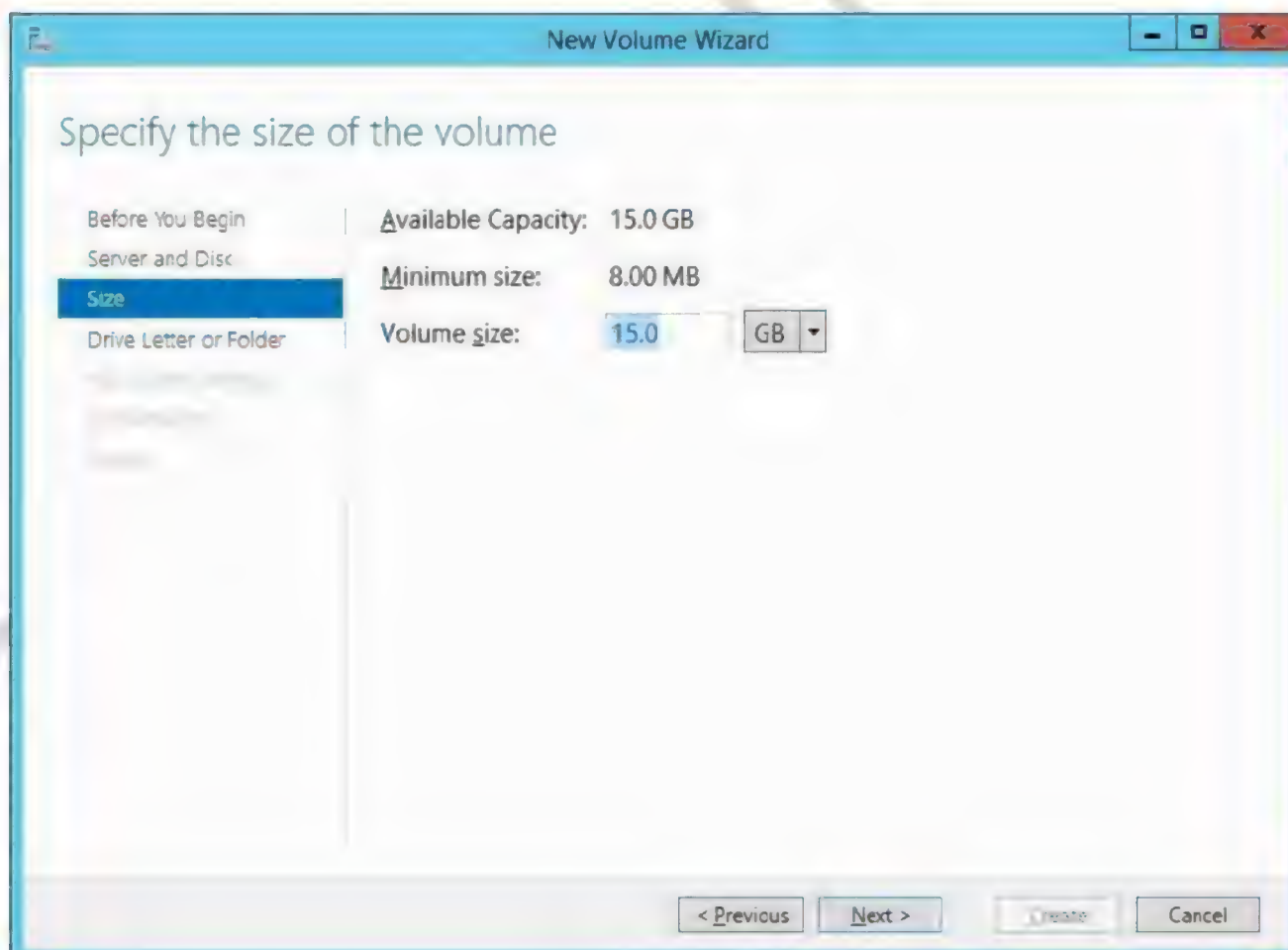




17. Select the Disk (Ex: Parity Disk), click **Next**.



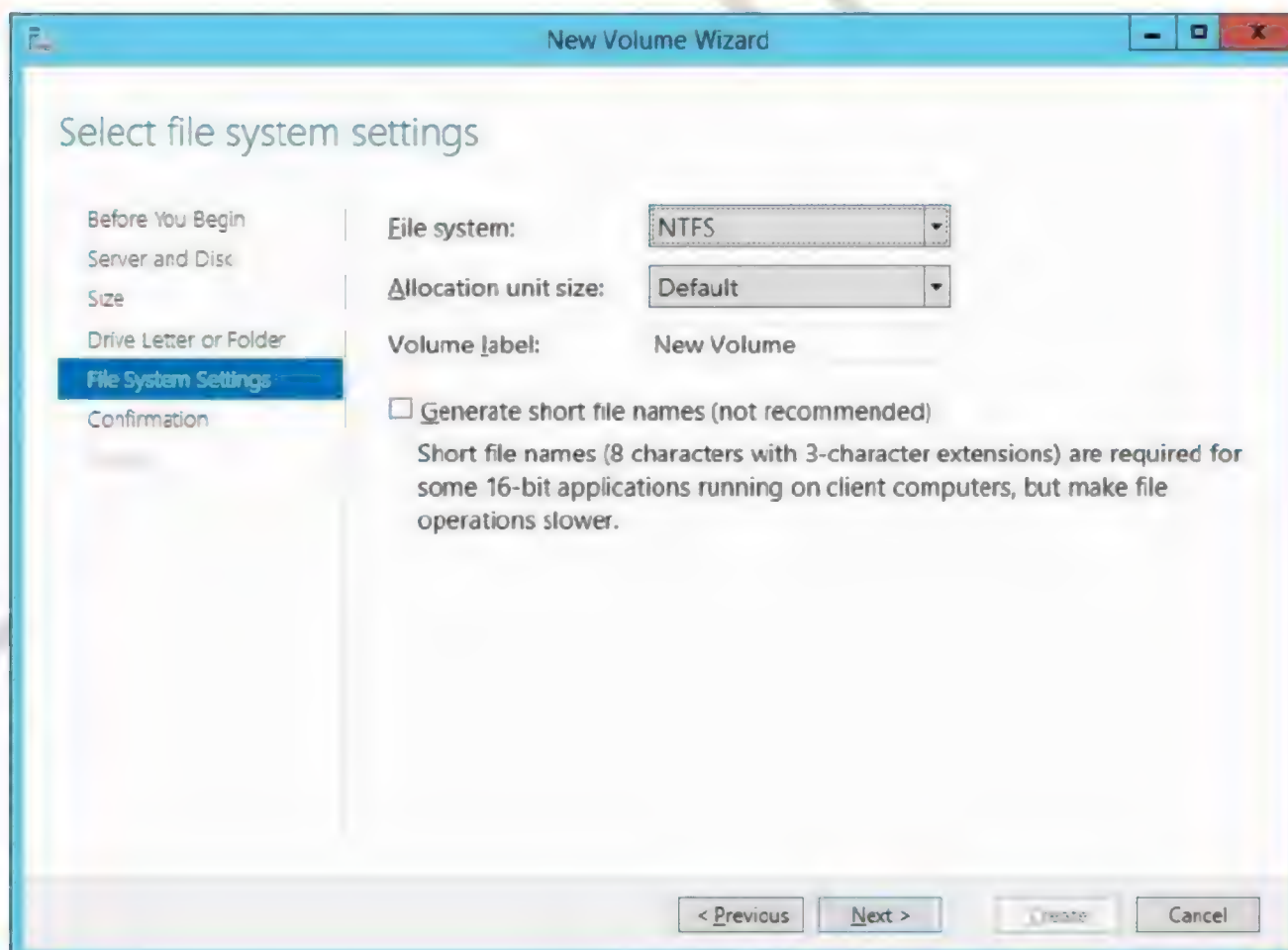
18. Enter the size of the volume, click **Next**.



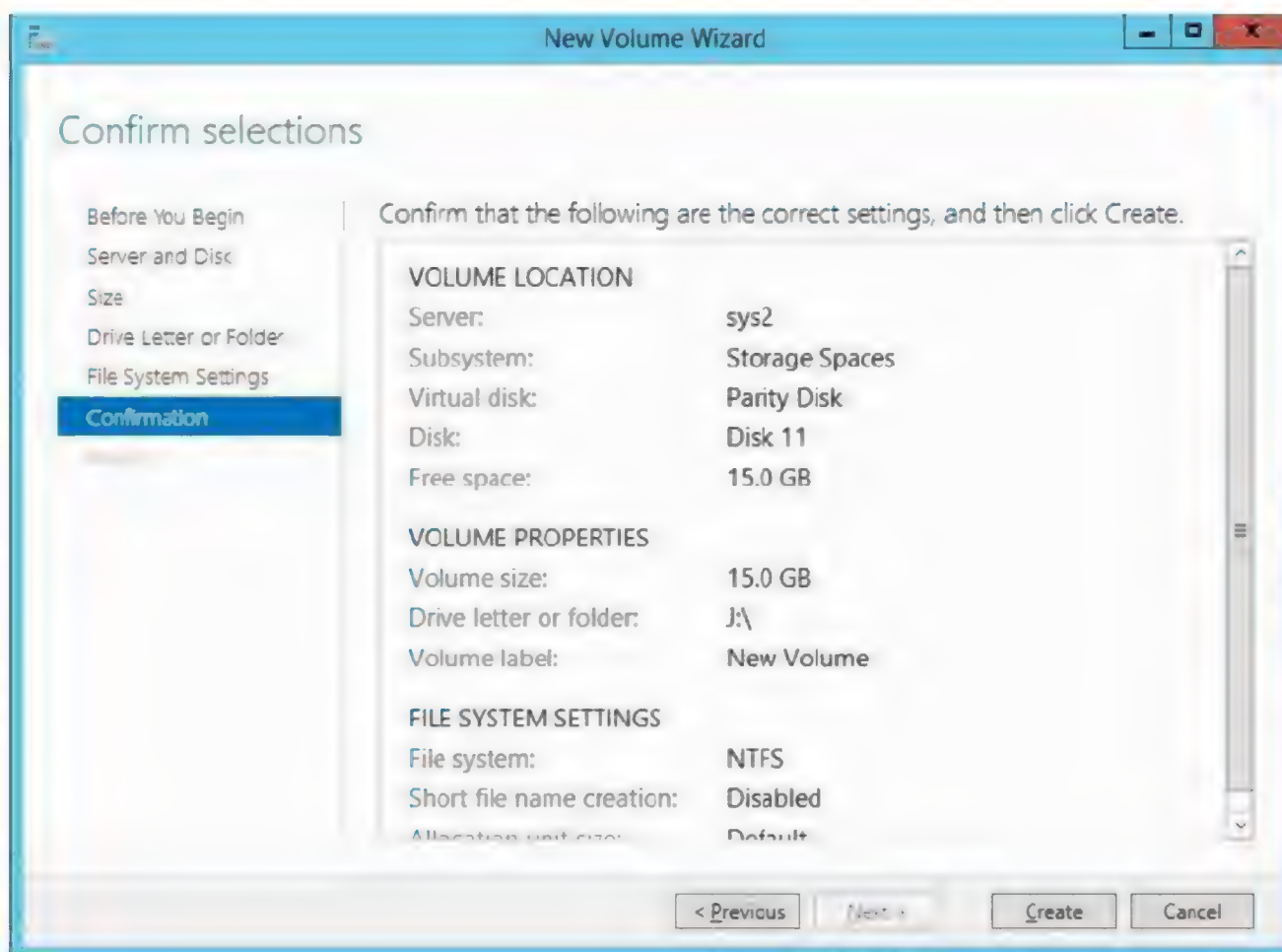
19. Select the Drive letter, click **Next**.



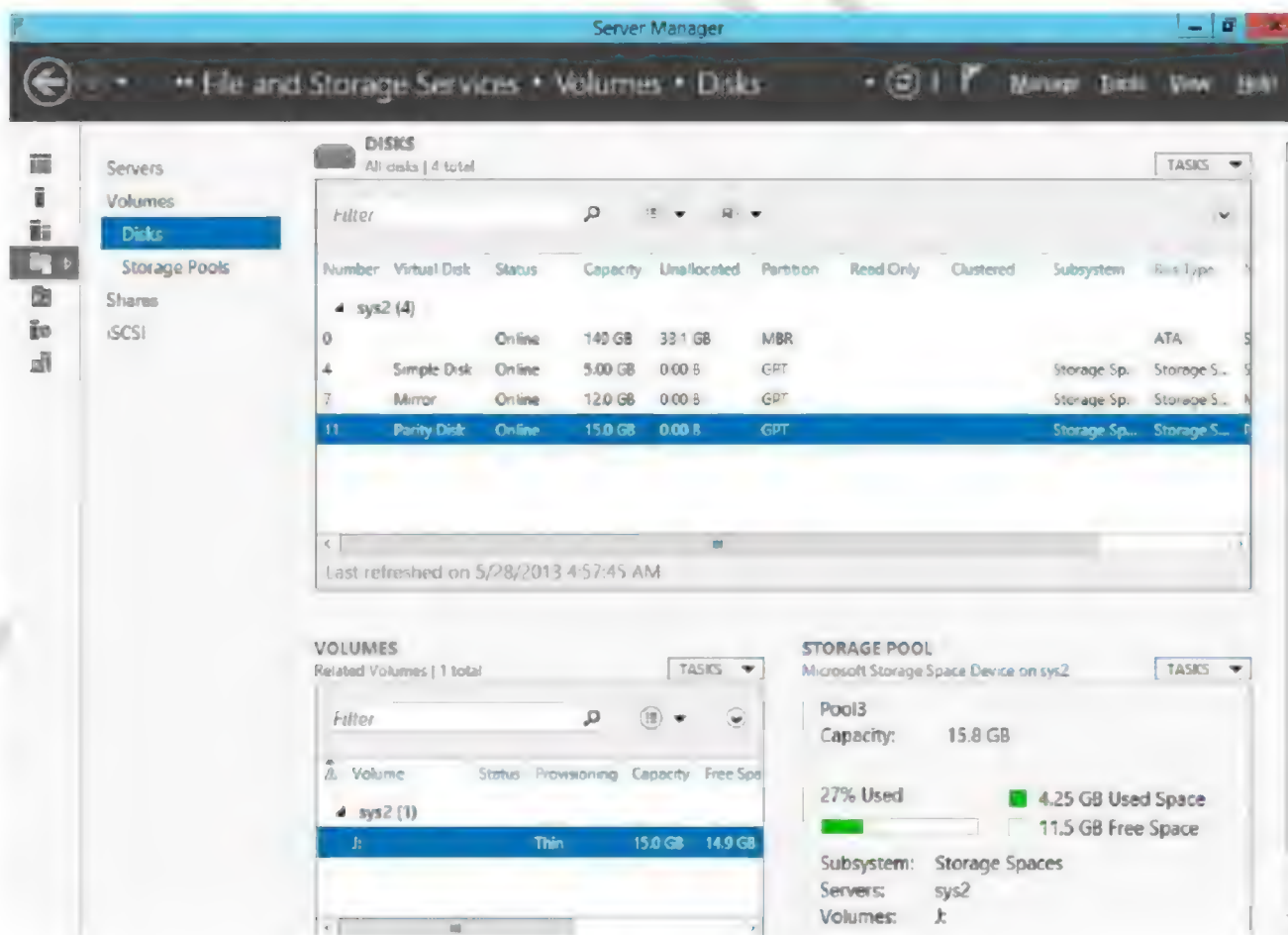
20. Select the file system, click **Next**.



21. Click **Create**.



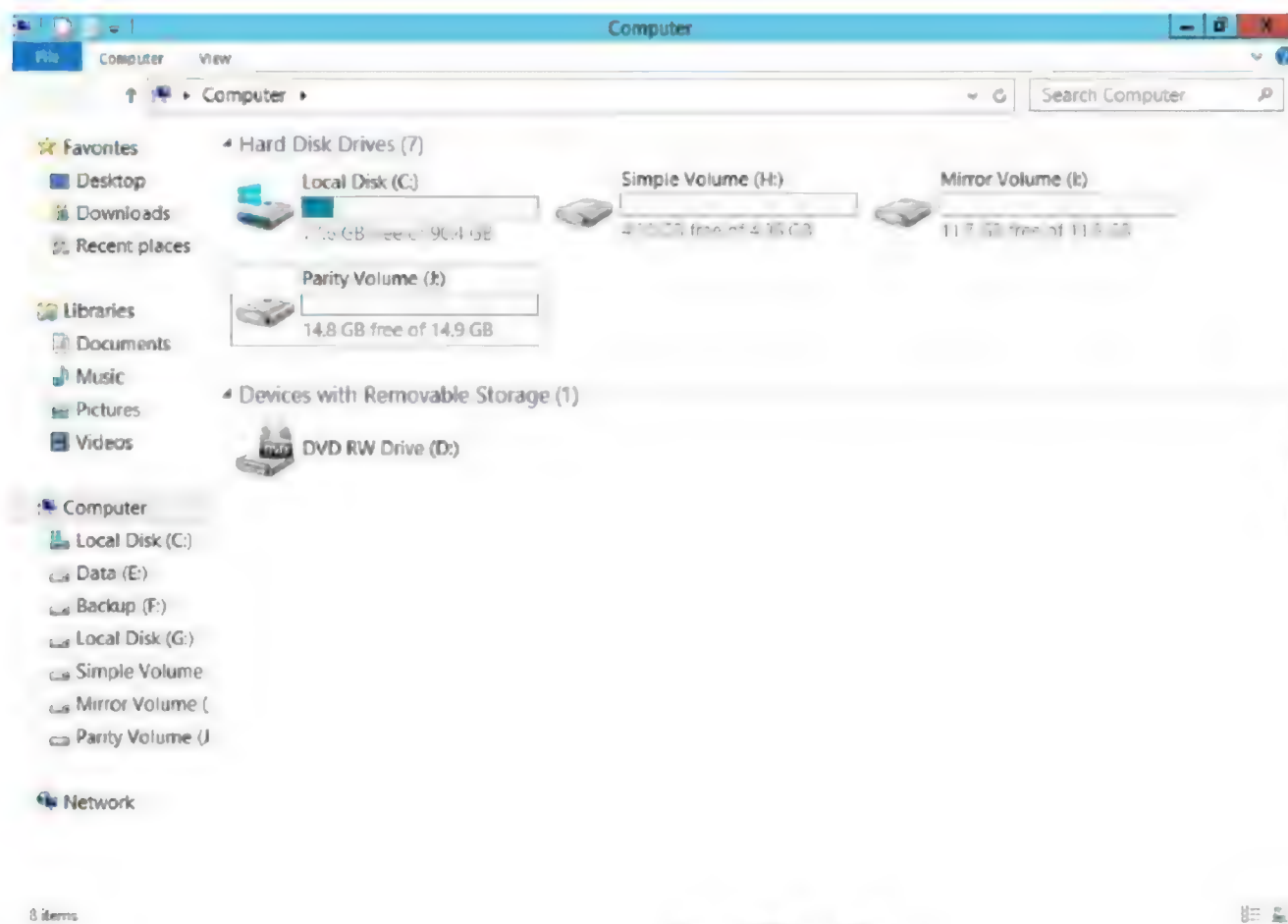
22. Verify for the Volumes (Simple, Mirror, Parity).





**Verification:**

1. Go to Start, select Computer Icon and verify for the Parity volume.



## Lab – 81: Failover Cluster

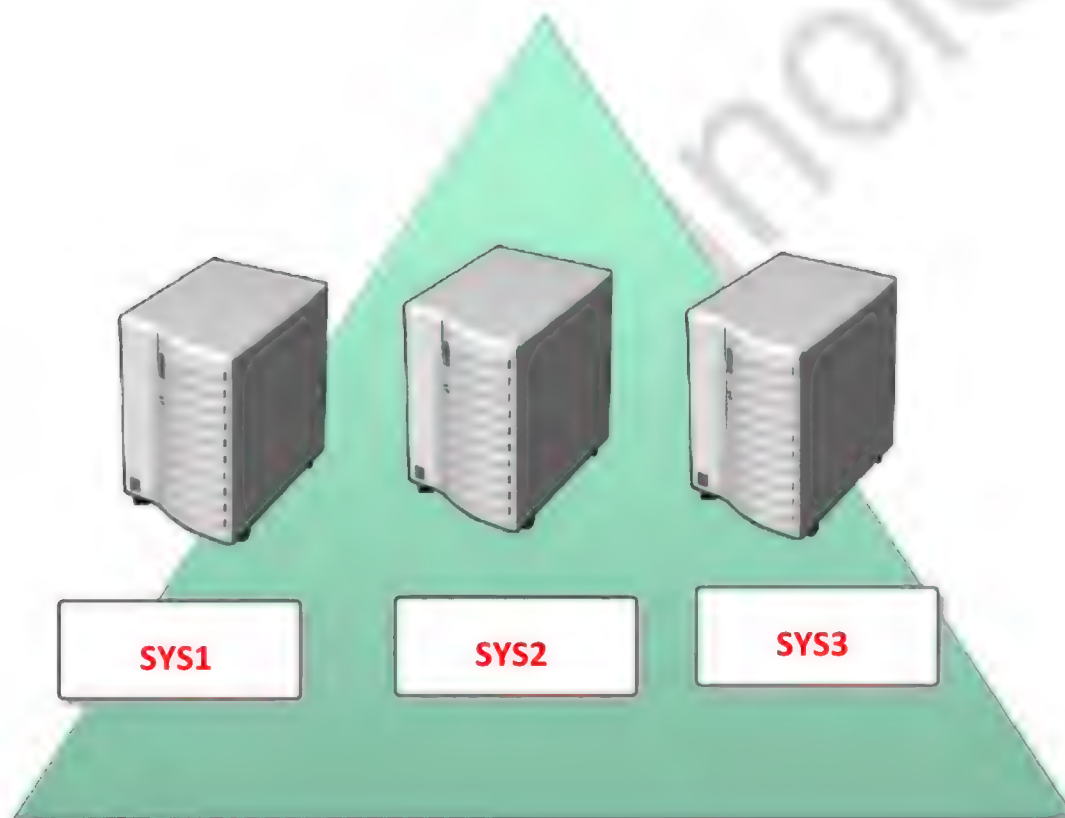
### Objective:

To Configuring High Availability of Services using Failover Clustering

### Pre-requisites:

Before working on this lab, you must have

- Three computers running Windows Server 2012 OS
- One Domain Controller and two Member Servers



MICROSOFT.COM

#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

#### SYS2/SYS3

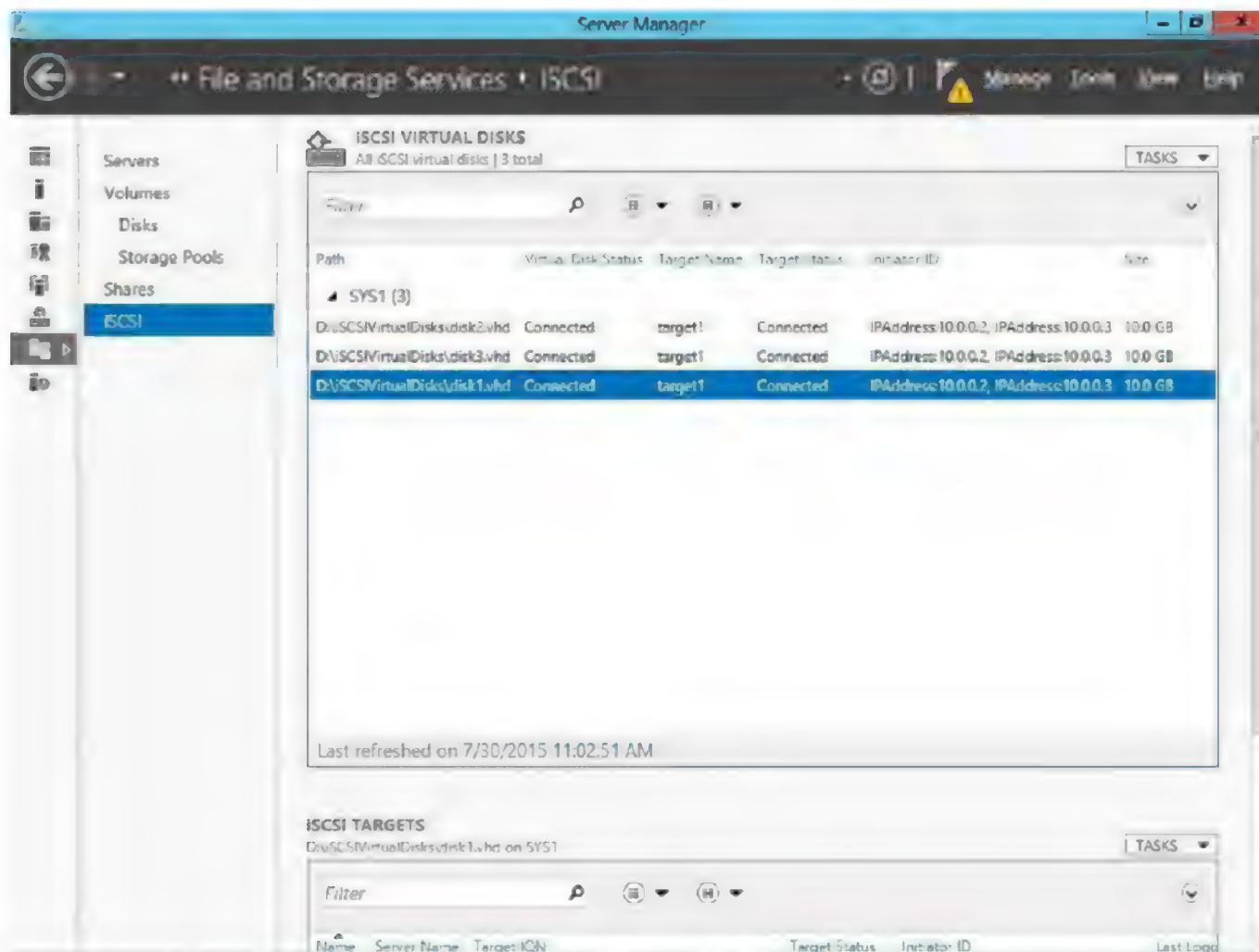
##### Member Servers

IP Address	10.0.0.2/10.0.0.3
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

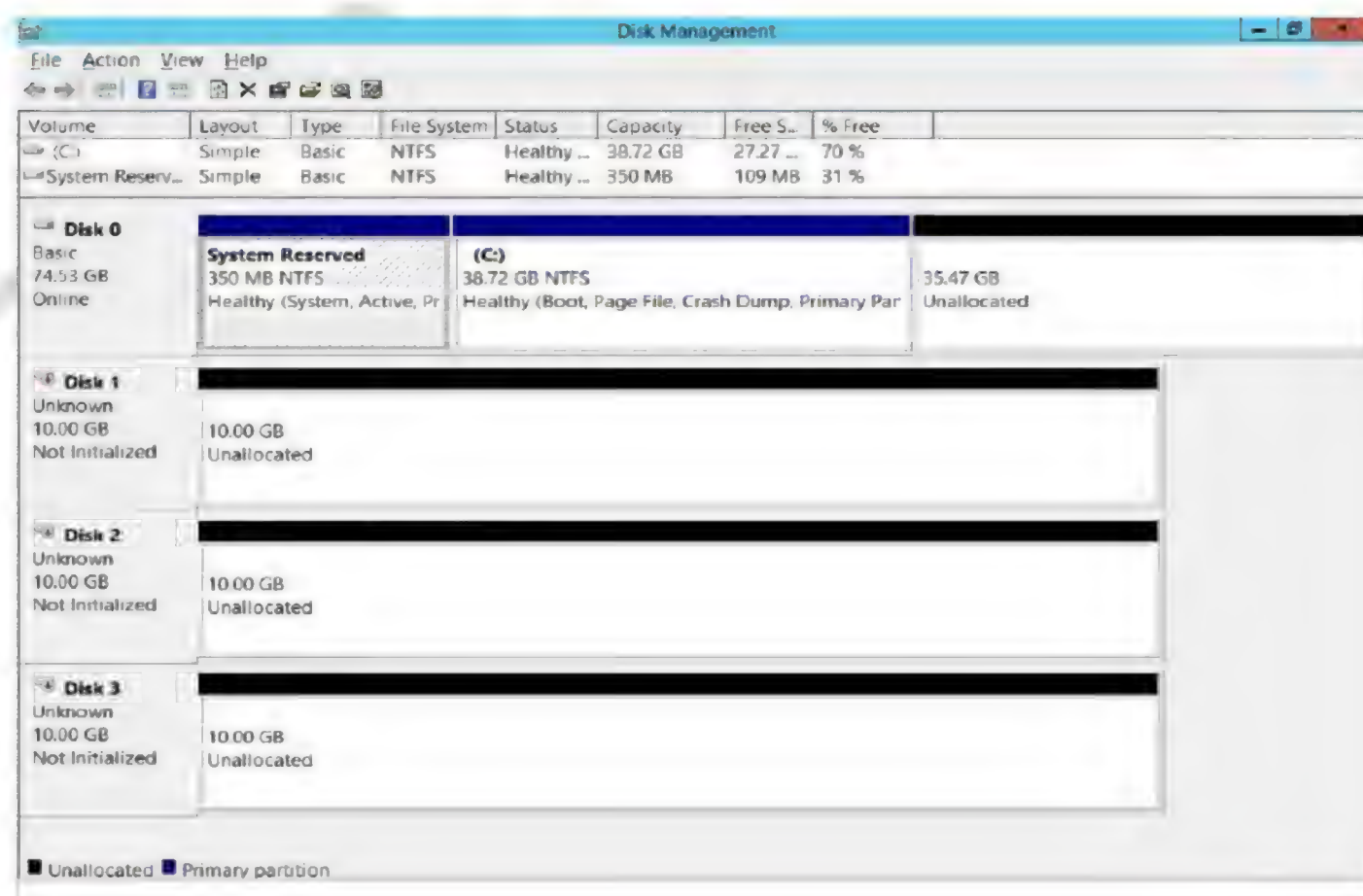


## Assigning iSCSI Disks to Hosts

1. In **SYS1**, install **iSCSI Target Server** and configure three **iSCSI Disks** to **SYS2** and **SYS3** with each size 10 GB



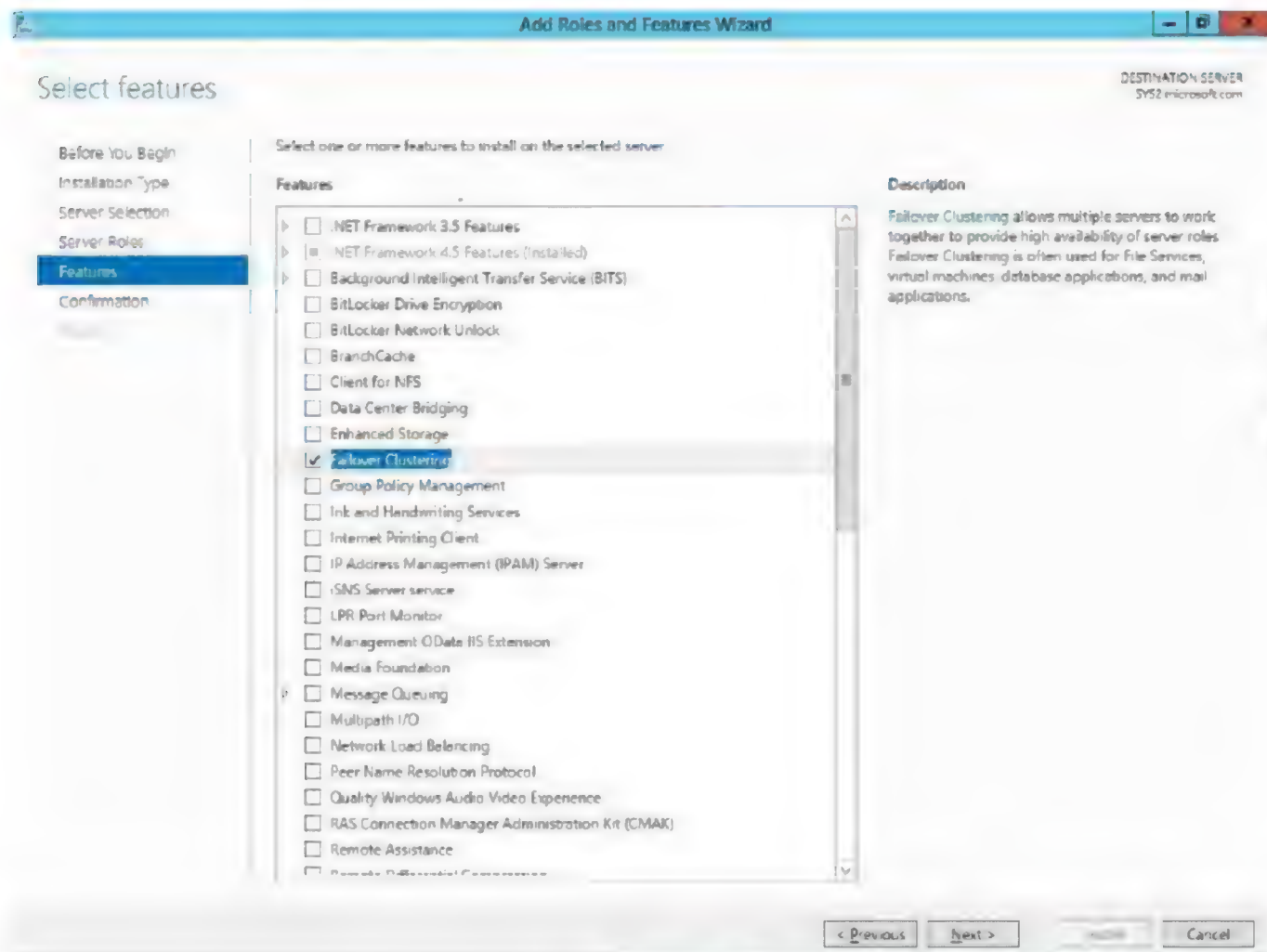
2. In **SYS2**→click **Start**→go to **iSCSI initiator**→connect to **Target Server** using **IP 10.0.0.1**→open **Disk Management** and verify three disks connected.





## Installing Failover Clustering

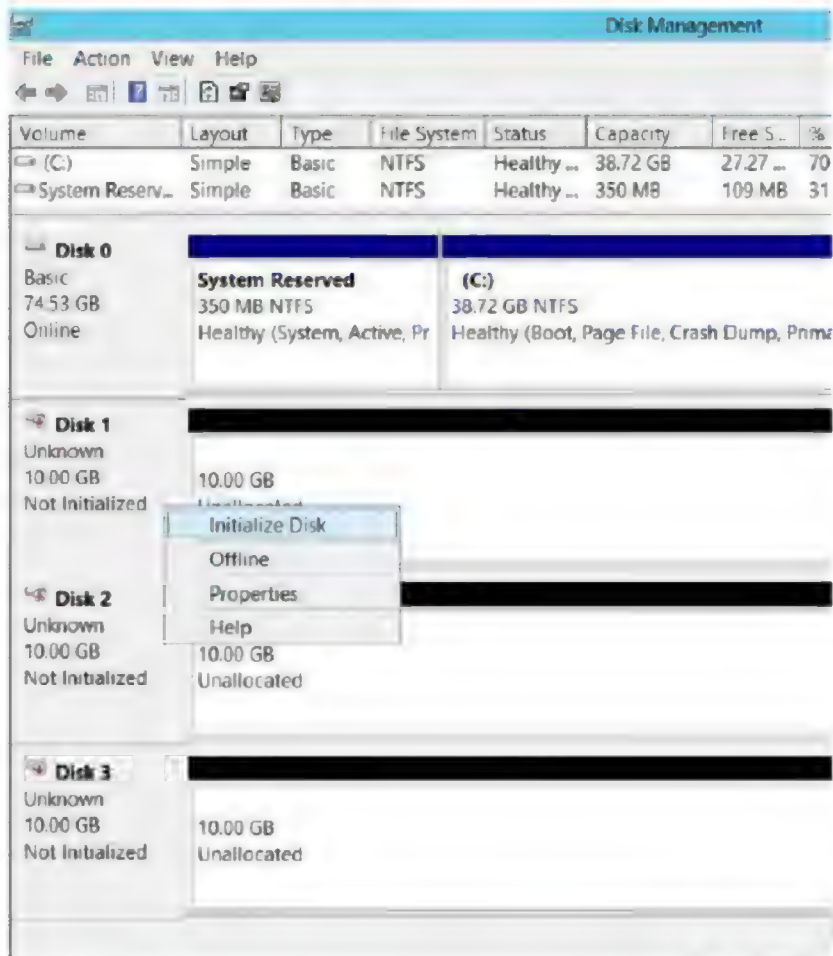
1. In **SYS2** → open **Server Manager** → add **Roles** and **Features** → in **Features** → check the box **FailoverClustering** → click **next** → **next** → click **Install**



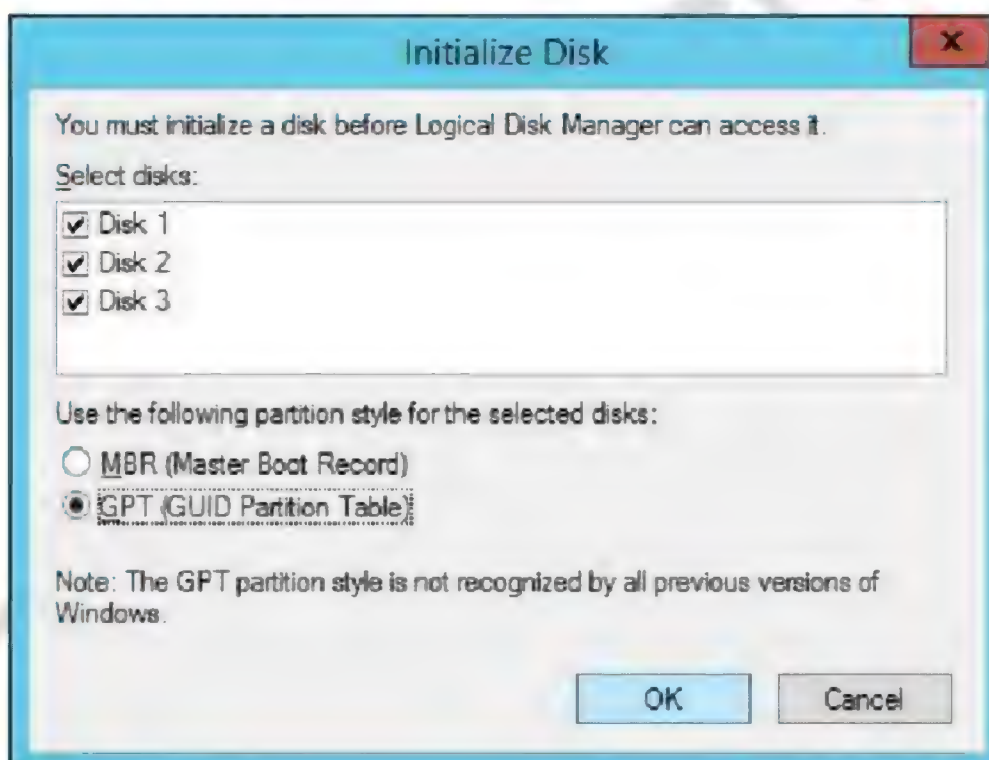
2. Repeat the same steps in **SYS3** also

## Create Necessary Volumes for Failover Cluster

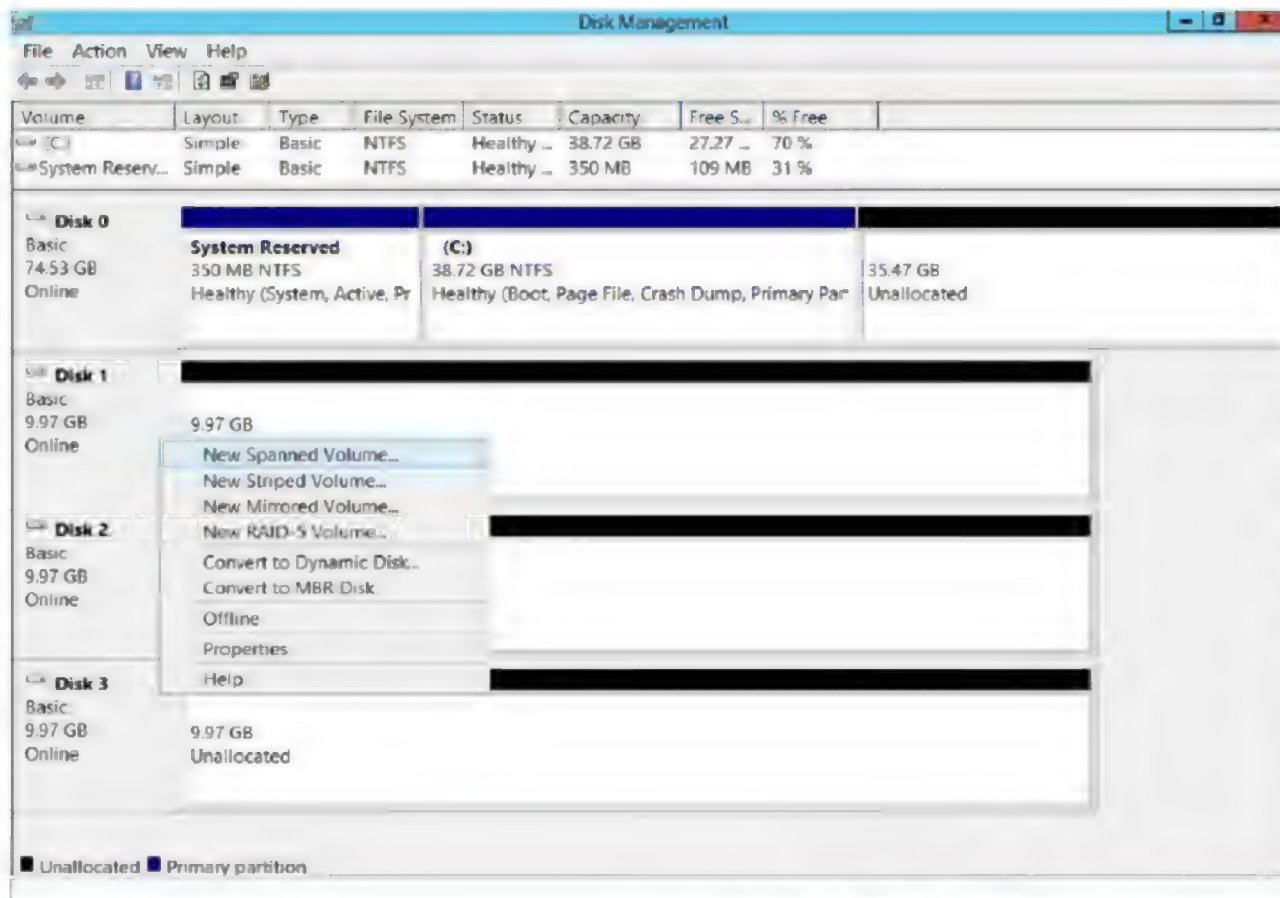
1. In SYS2→open Disk Management→right click Disk1→Initialize



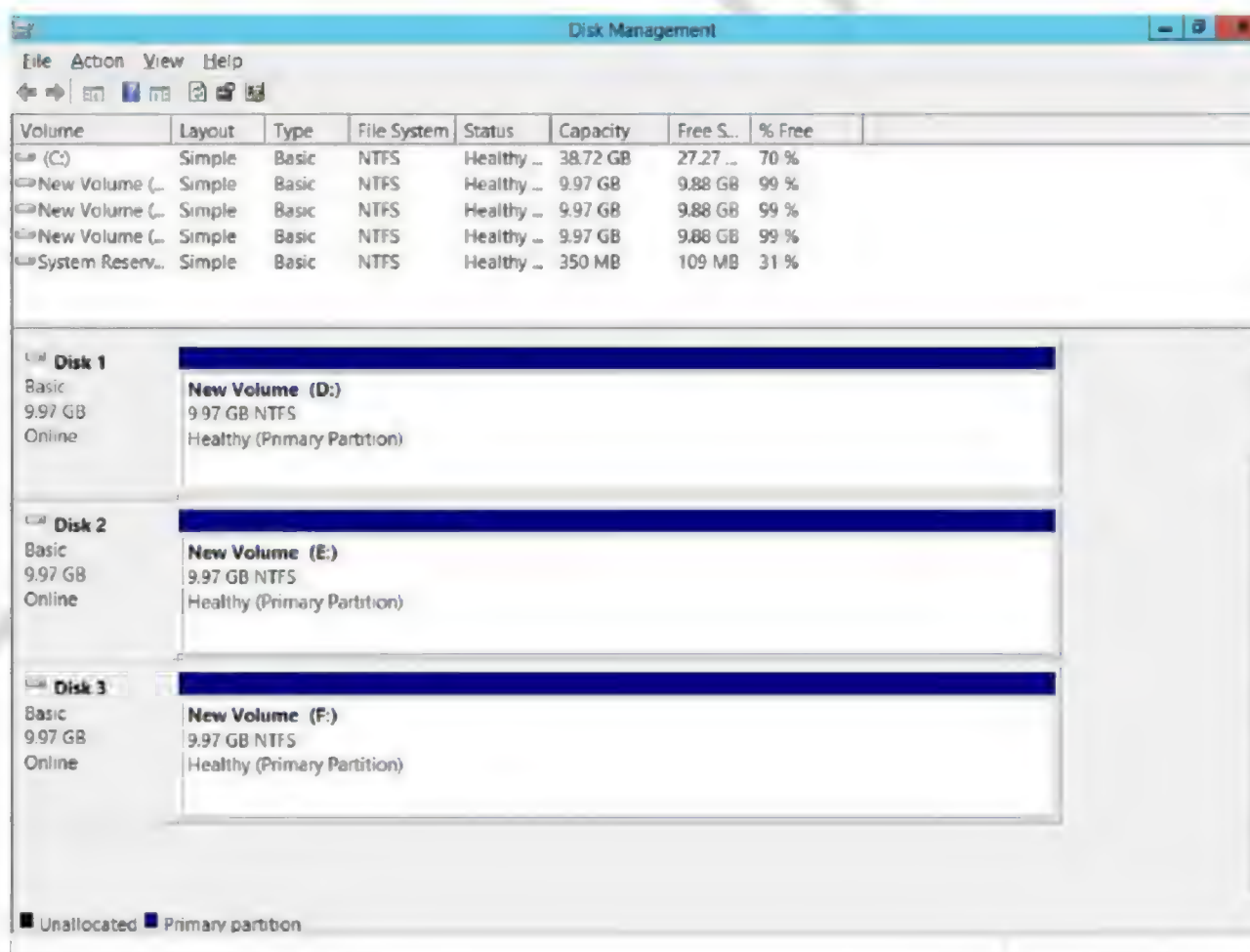
2. Select all three disks→select GPT→click Ok



3. Right click **DISK1** unallocated space → create **New Simple Volume** → repeat same steps for **disk2** and **disk3**



4. Verify three Disks are Online



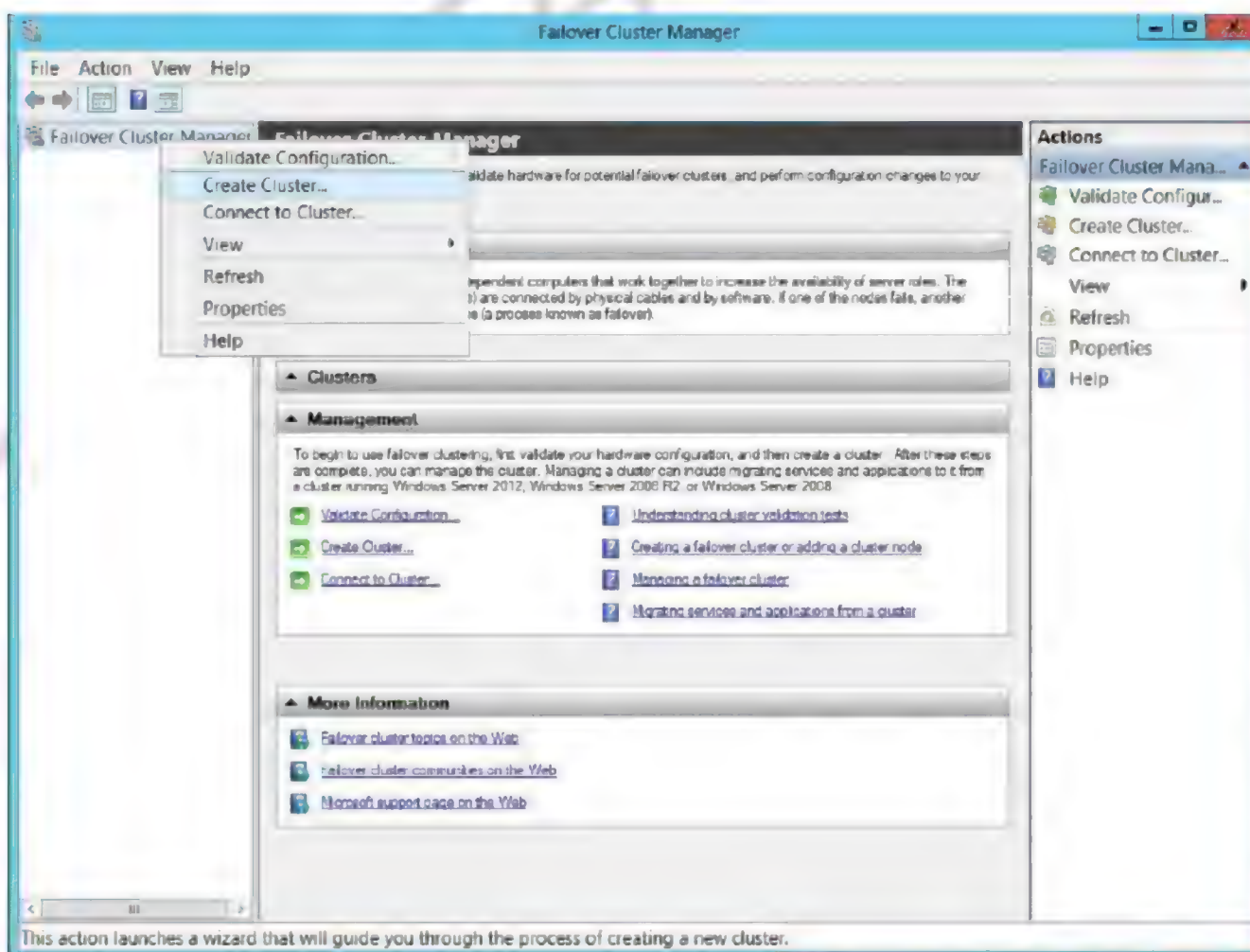


## Create Failover Cluster

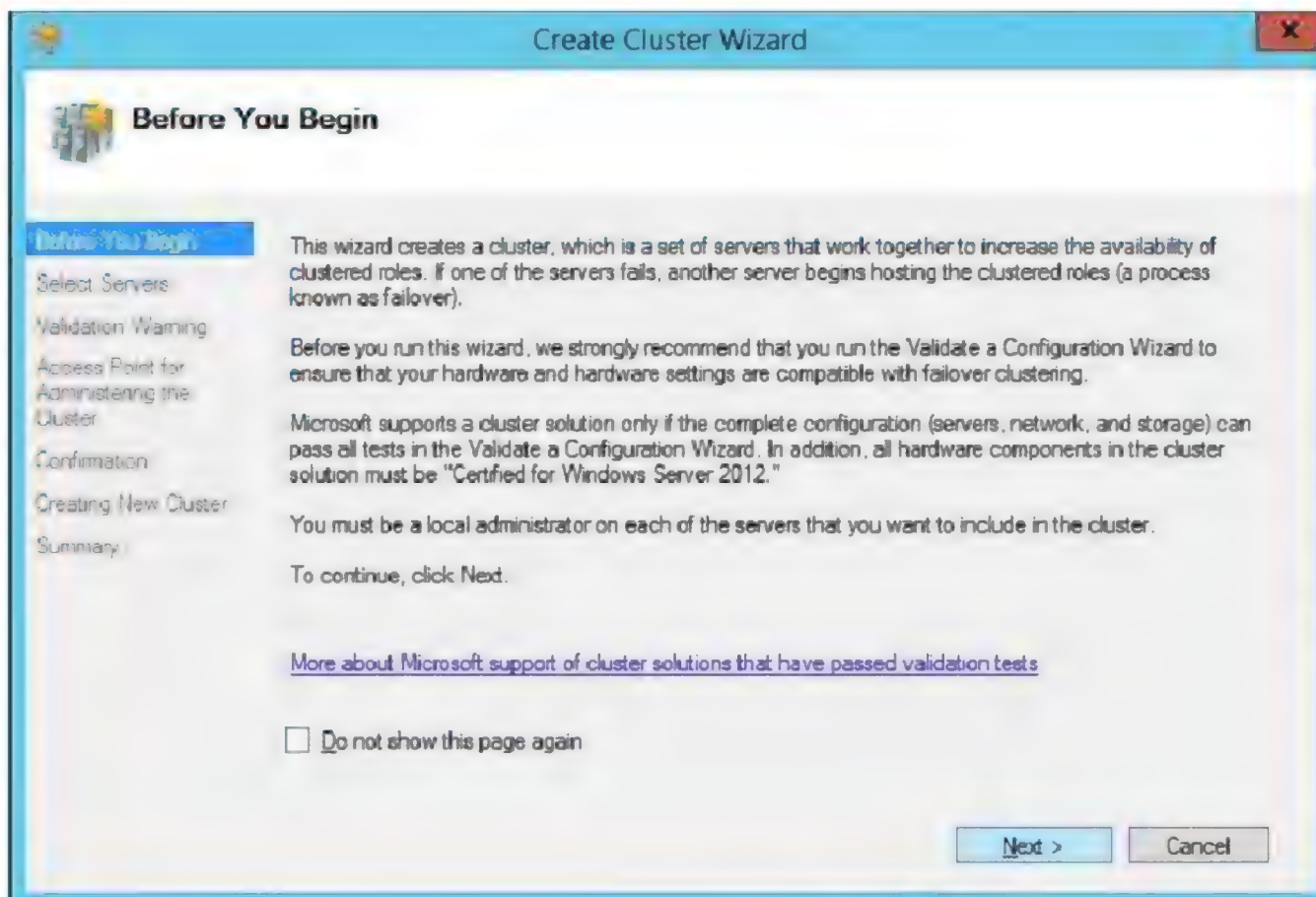
1. Log on to **SYS1** as **Administrator**→click **Press Windows Key** to go to **Start**→select **Failover Cluster**



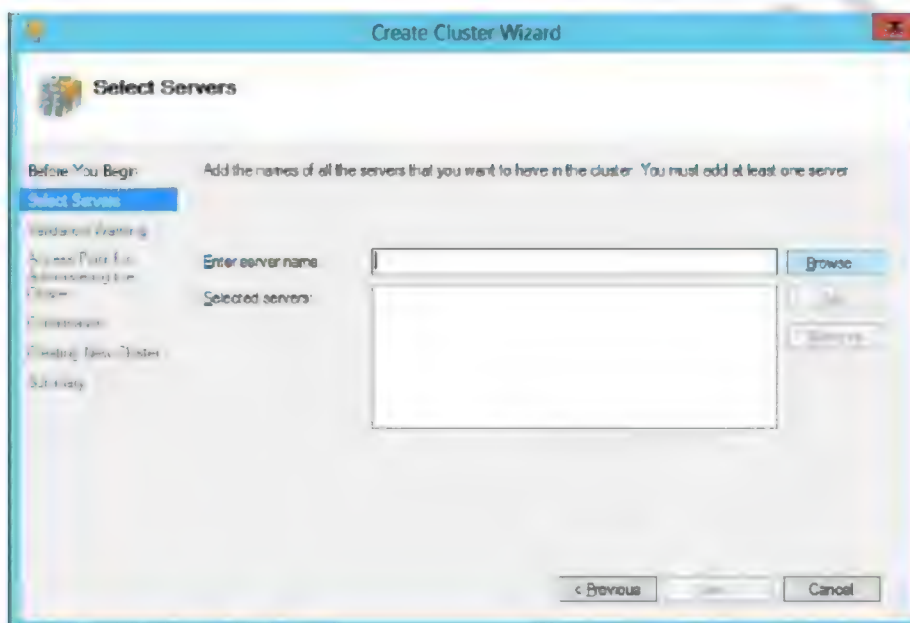
2. Right click **Failover Cluster**→create **Cluster**



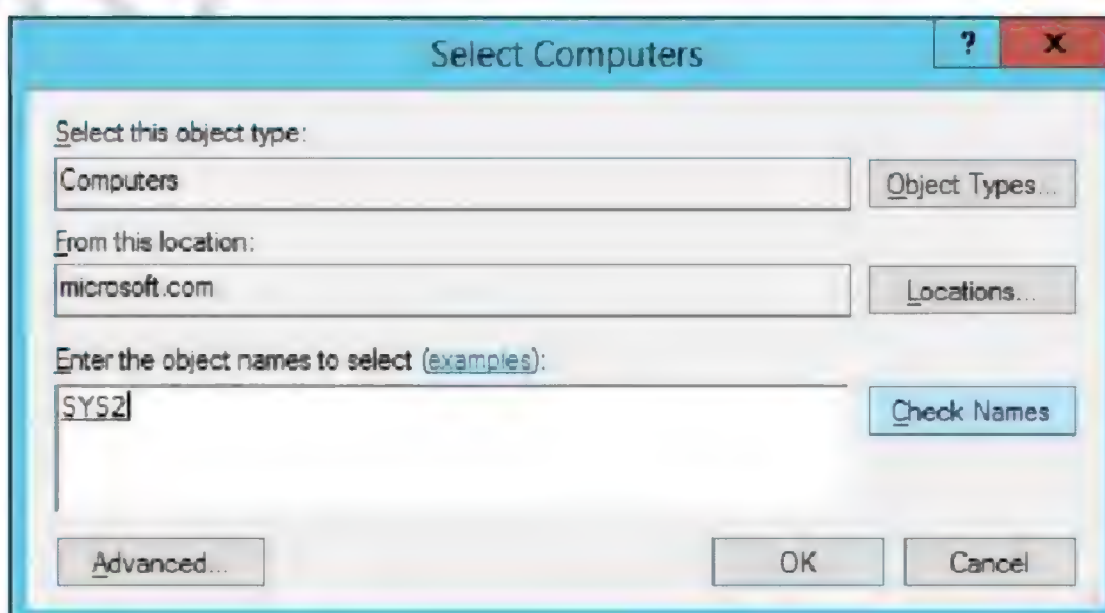
3. Click **Next**



4. Click **Next** → **Browse**

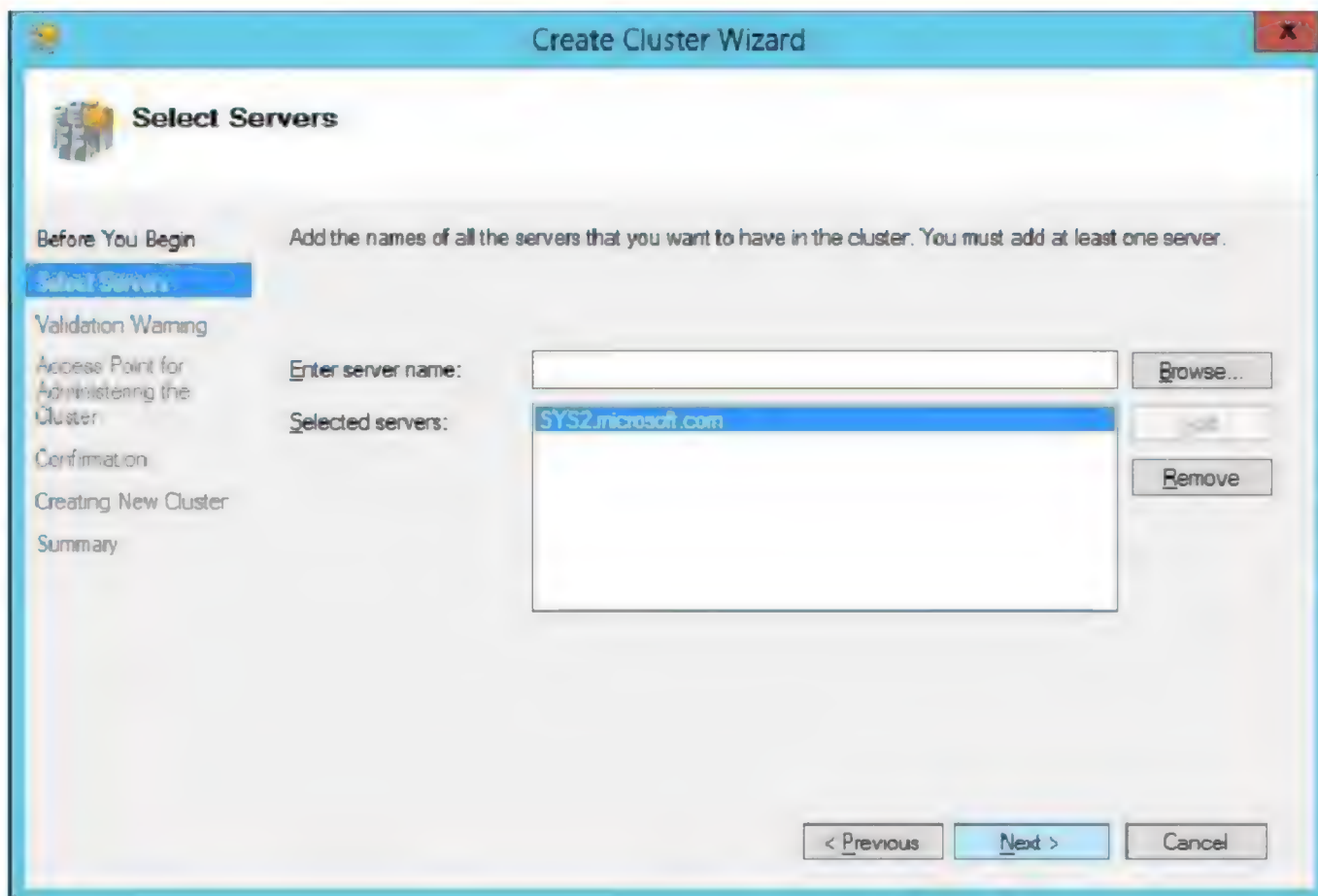


5. Enter **SYS2** name and click check names → click **OK**





6. Click **Next**



The screenshot shows the 'Create Cluster Wizard' window with the 'Select Servers' step selected in the left-hand navigation pane. The main area contains the following text: 'Add the names of all the servers that you want to have in the cluster. You must add at least one server.' Below this, there is a text box labeled 'Enter server name:' with a 'Browse...' button to its right. Underneath, a list box labeled 'Selected servers:' contains the text 'SYS2.microsoft.com'. To the right of the list box are '<' and 'Remove' buttons. At the bottom of the window are '< Previous', 'Next >', and 'Cancel' buttons.

7. Select **No** → click **Next** {ignore any warnings}



The screenshot shows the 'Create Cluster Wizard' window with the 'Validation Warning' step selected in the left-hand navigation pane. The main area contains a warning icon (yellow triangle with an exclamation mark) and the following text: 'For the servers you selected for this cluster, the reports from cluster configuration validation tests appear to be missing or incomplete. Microsoft supports a cluster solution only if the complete configuration (servers, network and storage) can pass all the tests in the Validate a Configuration wizard.' Below this, it asks 'Do you want to run configuration validation tests before continuing?'. There are two radio button options: 'Yes. When I click Next, run configuration validation tests, and then return to the process of creating the cluster.' (which is selected) and 'No. I do not require support from Microsoft for this cluster, and therefore do not want to run the validation tests. When I click Next, continue creating the cluster.' At the bottom, there is a link: 'More about Microsoft support of cluster solutions that have passed validation tests'. At the bottom of the window are '< Previous', 'Next >', and 'Cancel' buttons.



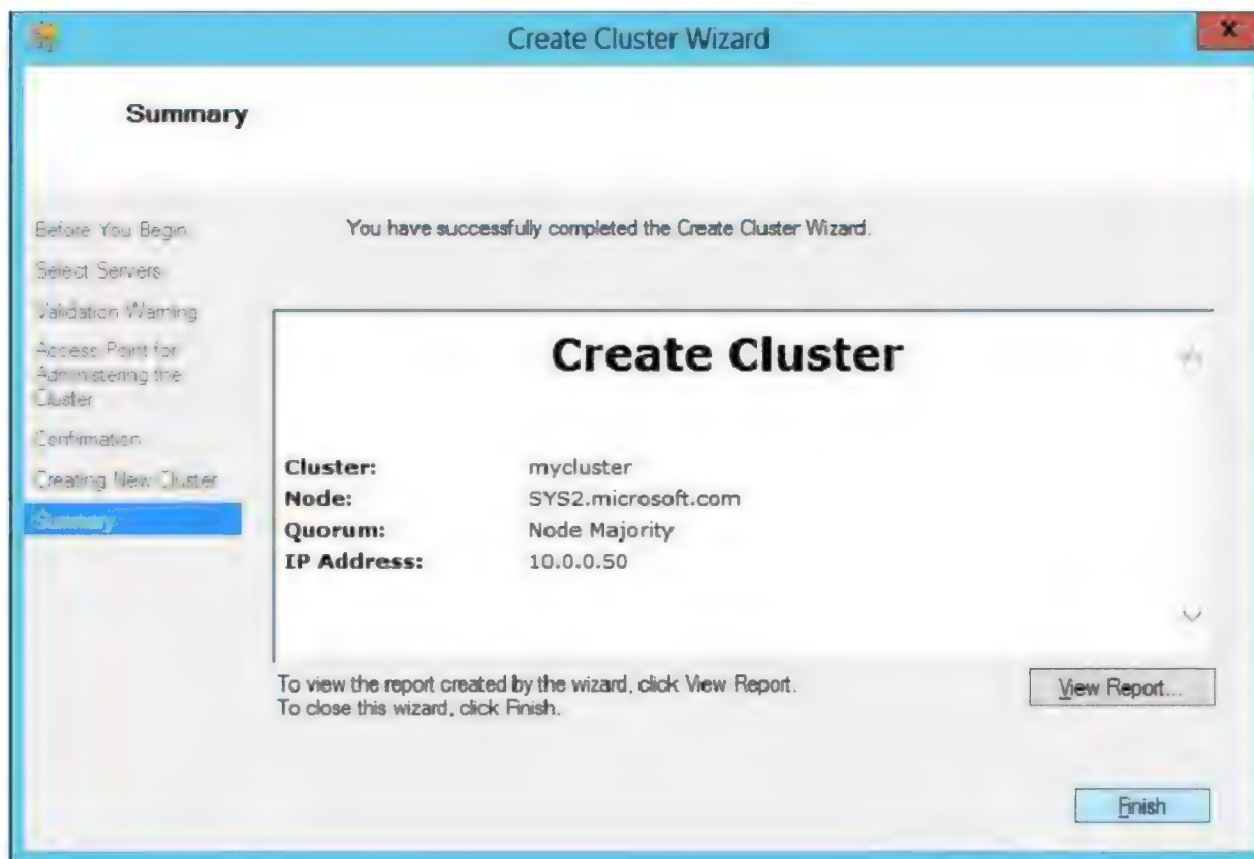
8. Enter cluster name example **MyCluster** → enter IP Address (Ex:-10.0.0.50) → click **Next**

The screenshot shows the 'Create Cluster Wizard' window with the title bar 'Create Cluster Wizard'. The main window has a sidebar on the left with the following steps: 'Before You Begin', 'Select Servers', 'Validation Warning', 'Access Point for Administering the Cluster' (highlighted in blue), 'Confirmation', 'Creating New Cluster', and 'Summary'. The main area is titled 'Access Point for Administering the Cluster'. It contains a text box for 'Cluster Name' with the value 'mycluster'. Below this is a warning icon and text: 'The NetBIOS name is limited to 15 characters. One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.' Below the warning is a table with two columns: 'Networks' and 'Address'. The table has one row with a checked checkbox in the 'Networks' column, the value '10.0.0.0/8' in the 'Networks' column, and the value '10.0.0.50' in the 'Address' column. At the bottom right are three buttons: '< Previous', 'Next >', and 'Cancel'.

Networks	Address
<input checked="" type="checkbox"/>	10.0.0.0/8
	10.0.0.50

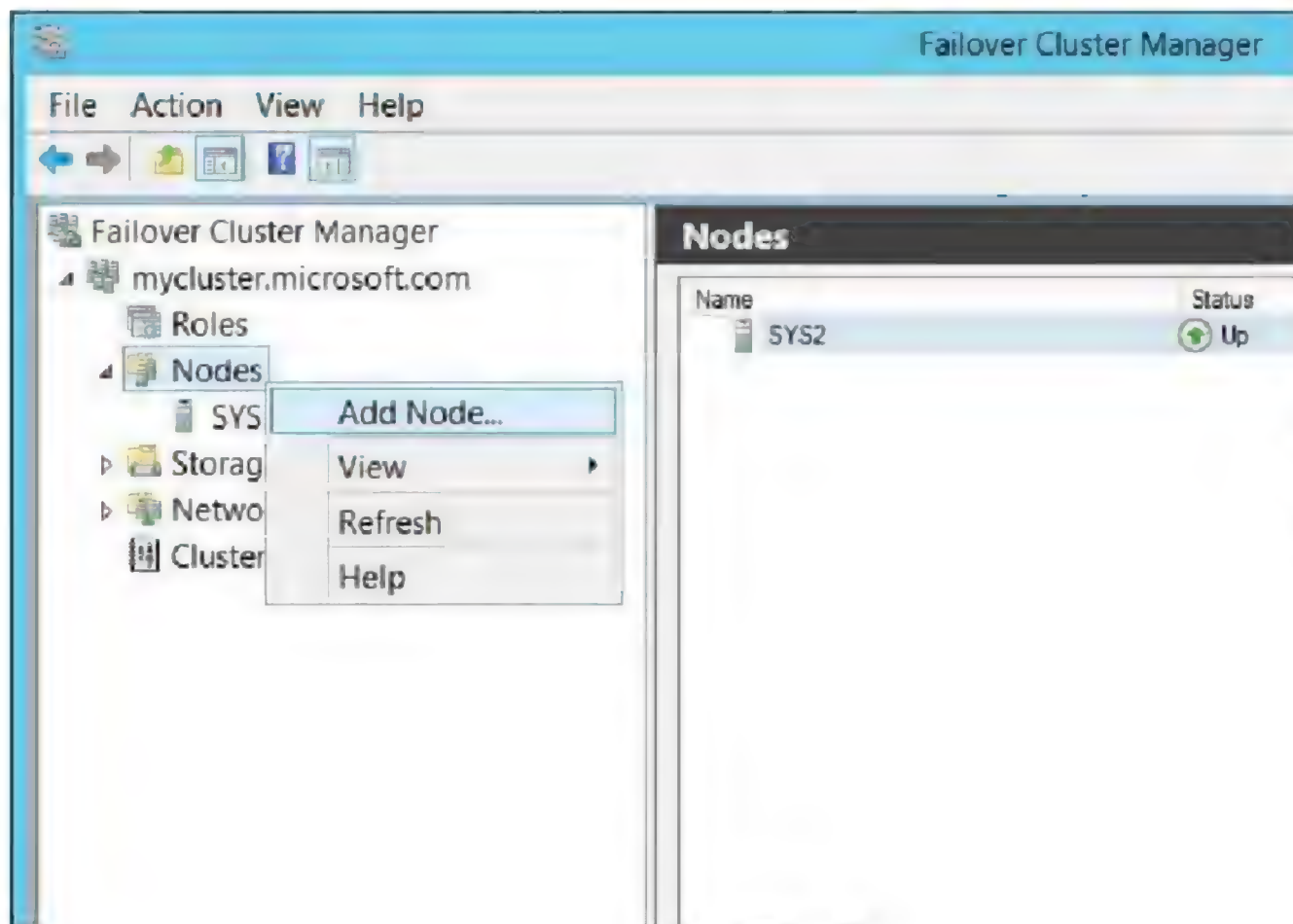
9. Click **Next**

The screenshot shows the 'Create Cluster Wizard' window with the title bar 'Create Cluster Wizard'. The main window has a sidebar on the left with the following steps: 'Before You Begin', 'Select Servers', 'Validation Warning', 'Access Point for Administering the Cluster', 'Confirmation' (highlighted in blue), 'Creating New Cluster', and 'Summary'. The main area is titled 'Confirmation'. It contains the text: 'You are ready to create a cluster. The wizard will create your cluster with the following settings:'. Below this is a box with the following settings: 'Cluster: mycluster', 'Node: SYS2.microsoft.com', and 'IP Address: 10.0.0.50'. At the bottom left is the text: 'To continue, click Next.' At the bottom right are three buttons: '< Previous', 'Next >', and 'Cancel'.

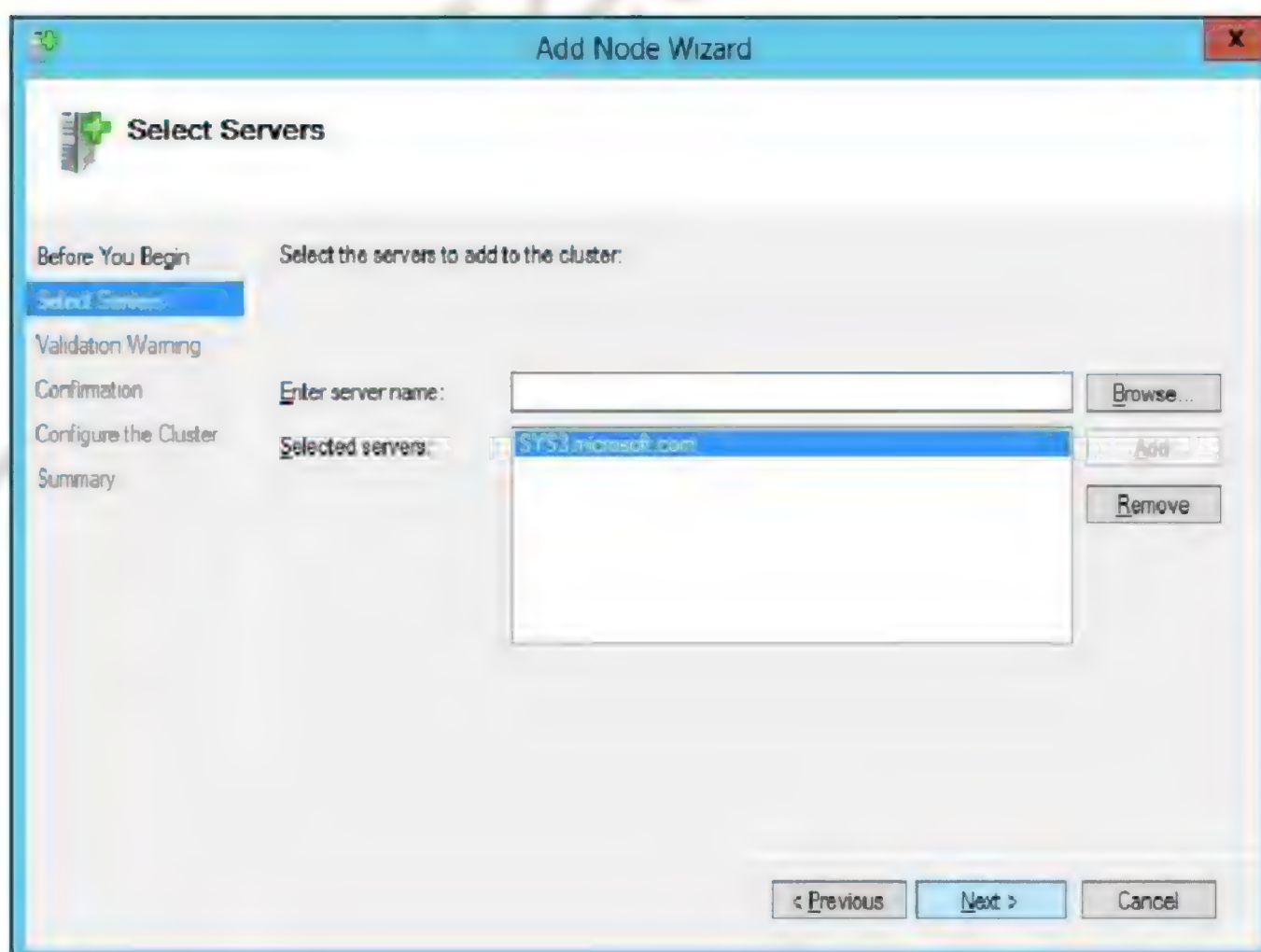
10. Click **Finish**

## Adding nodes and disks to cluster

1. Open **Failover Cluster Manager**→right click **Nodes**→add **Node**

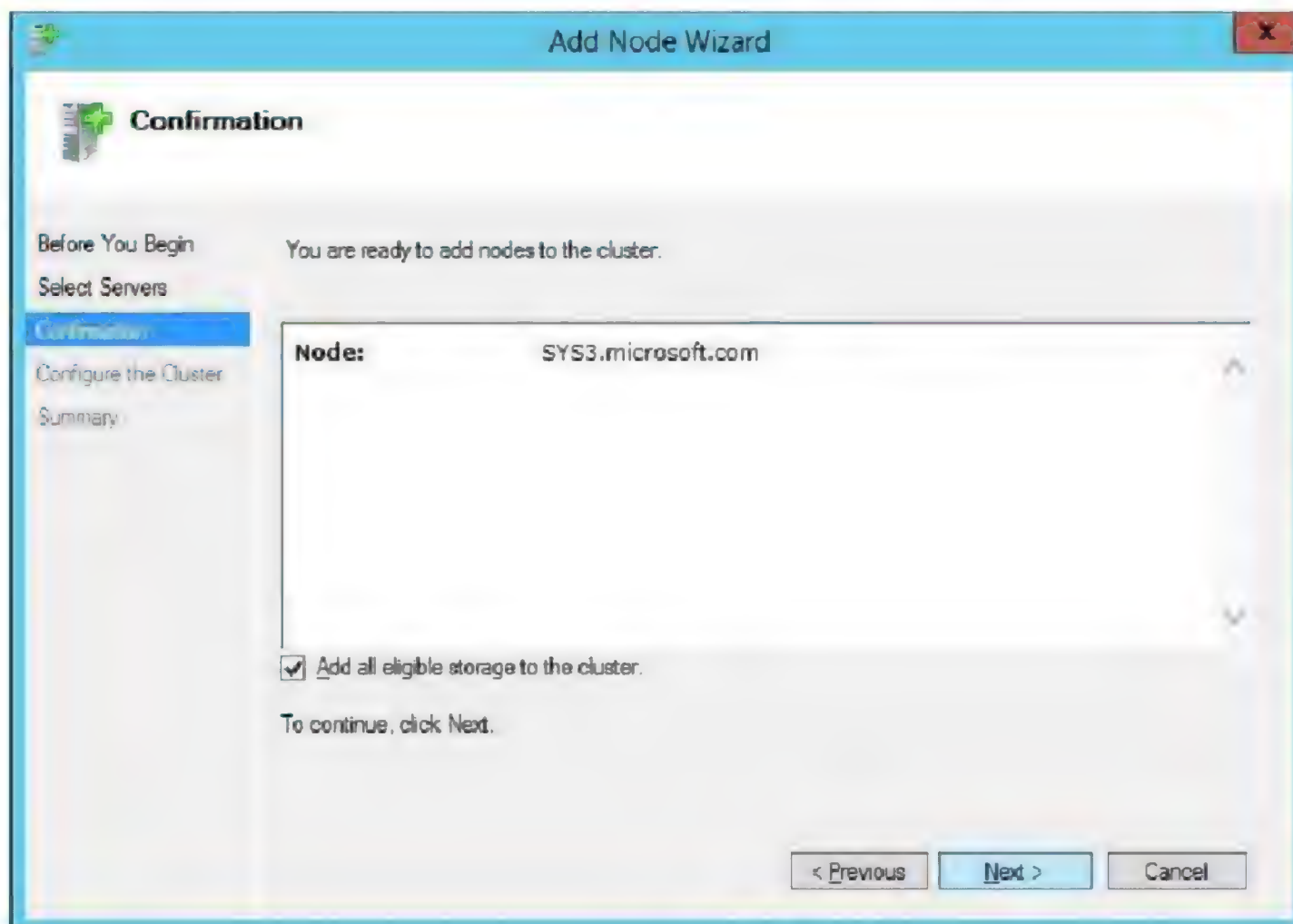


2. Click **Browse**→enter **SYS3** name→click check **Names**→click **Ok**→**Next**

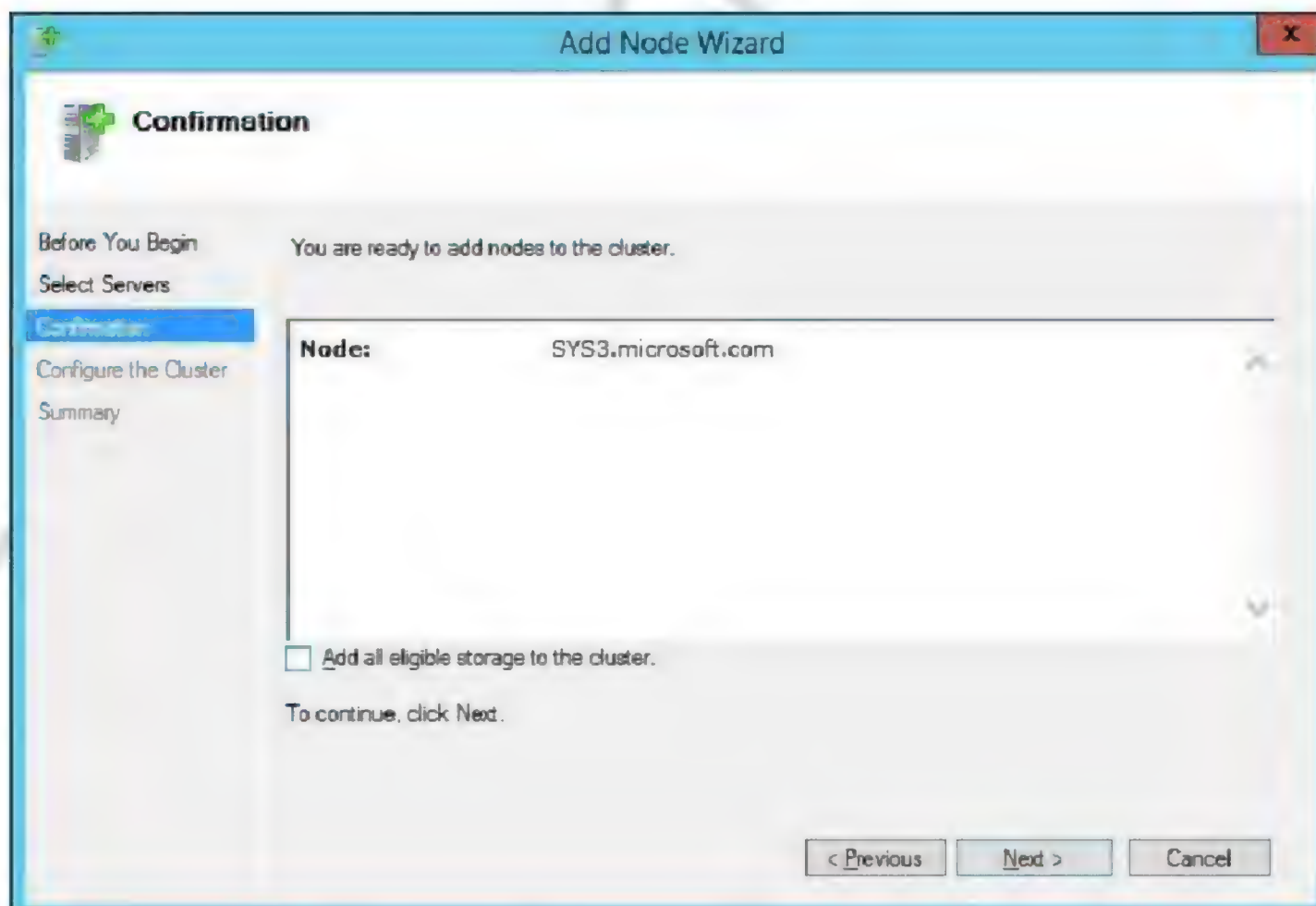




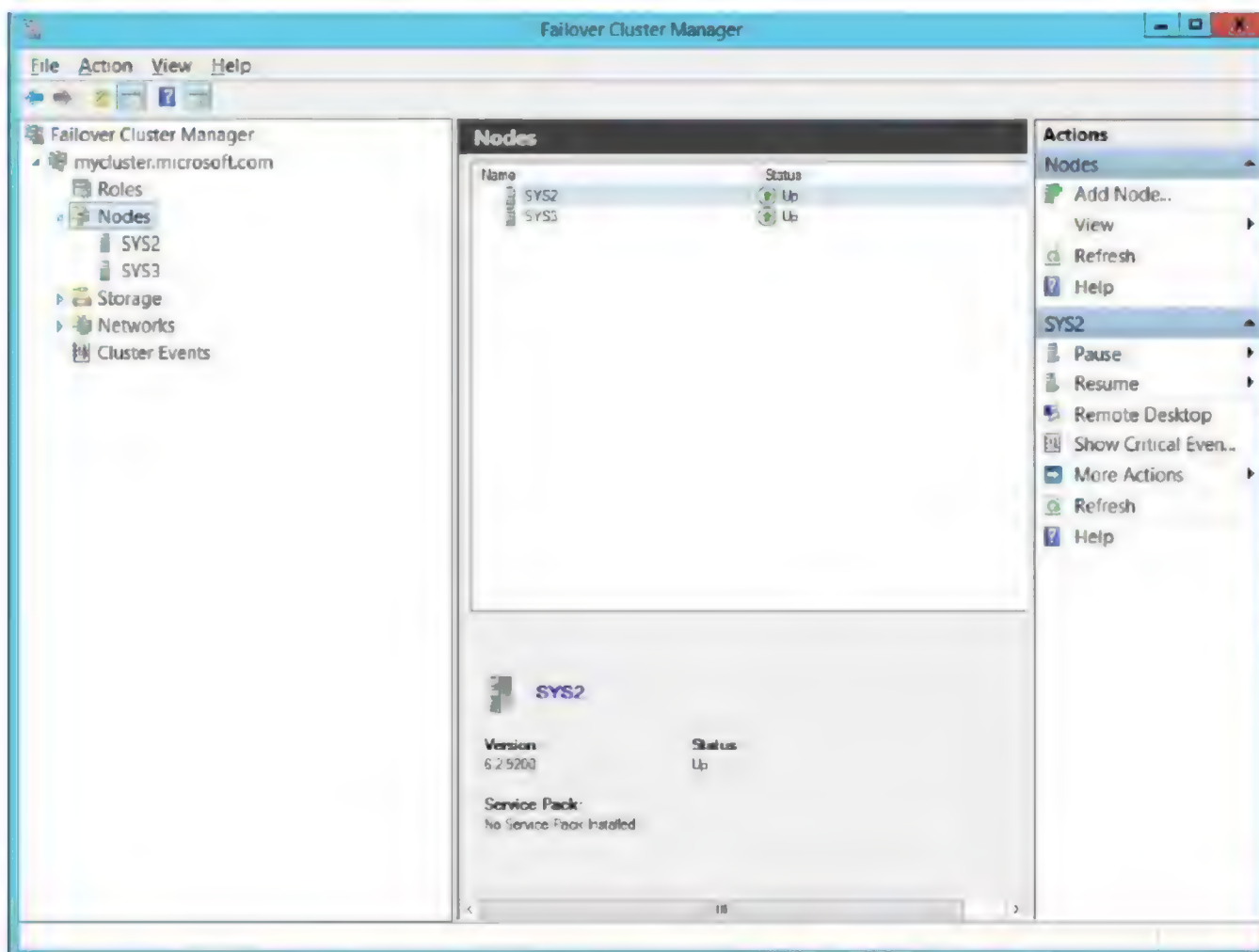
3. In Confirmation Windows **Uncheck the Box add All Eligible Storage** → click **Next**



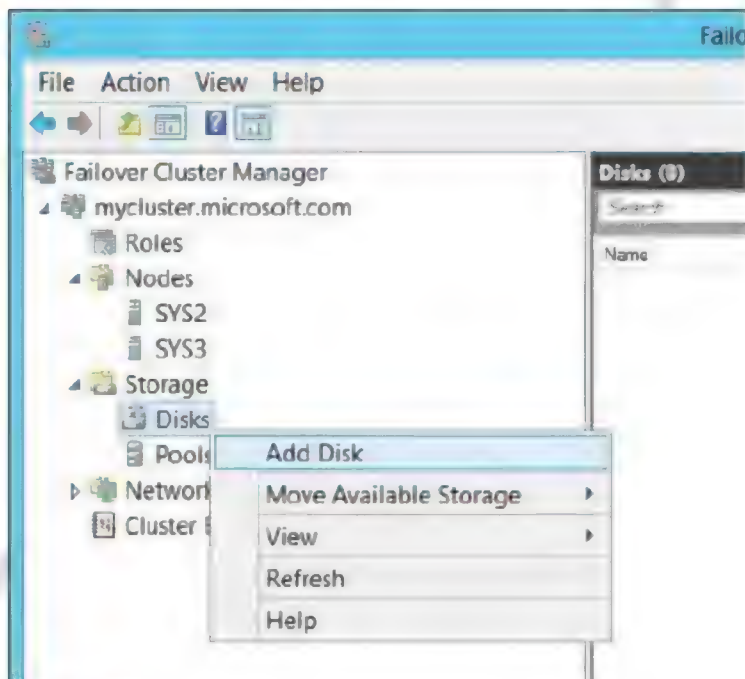
4. Click **Next**



5. Verify Nodes (Ex: SYS2, SYS3)



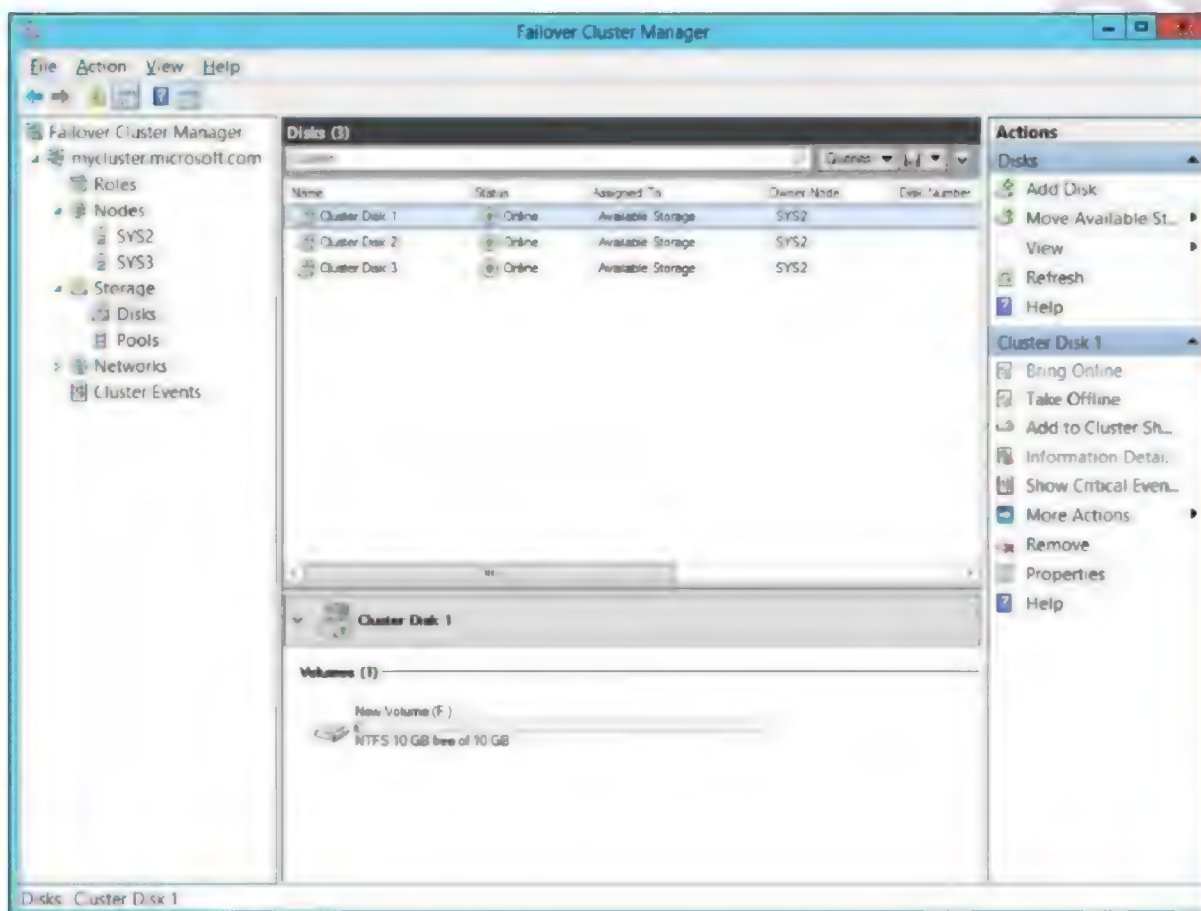
6. In Failover Cluster Manager → expand Storage → right click Disks → add Disk



7. Select **all three disks**→click **Ok**

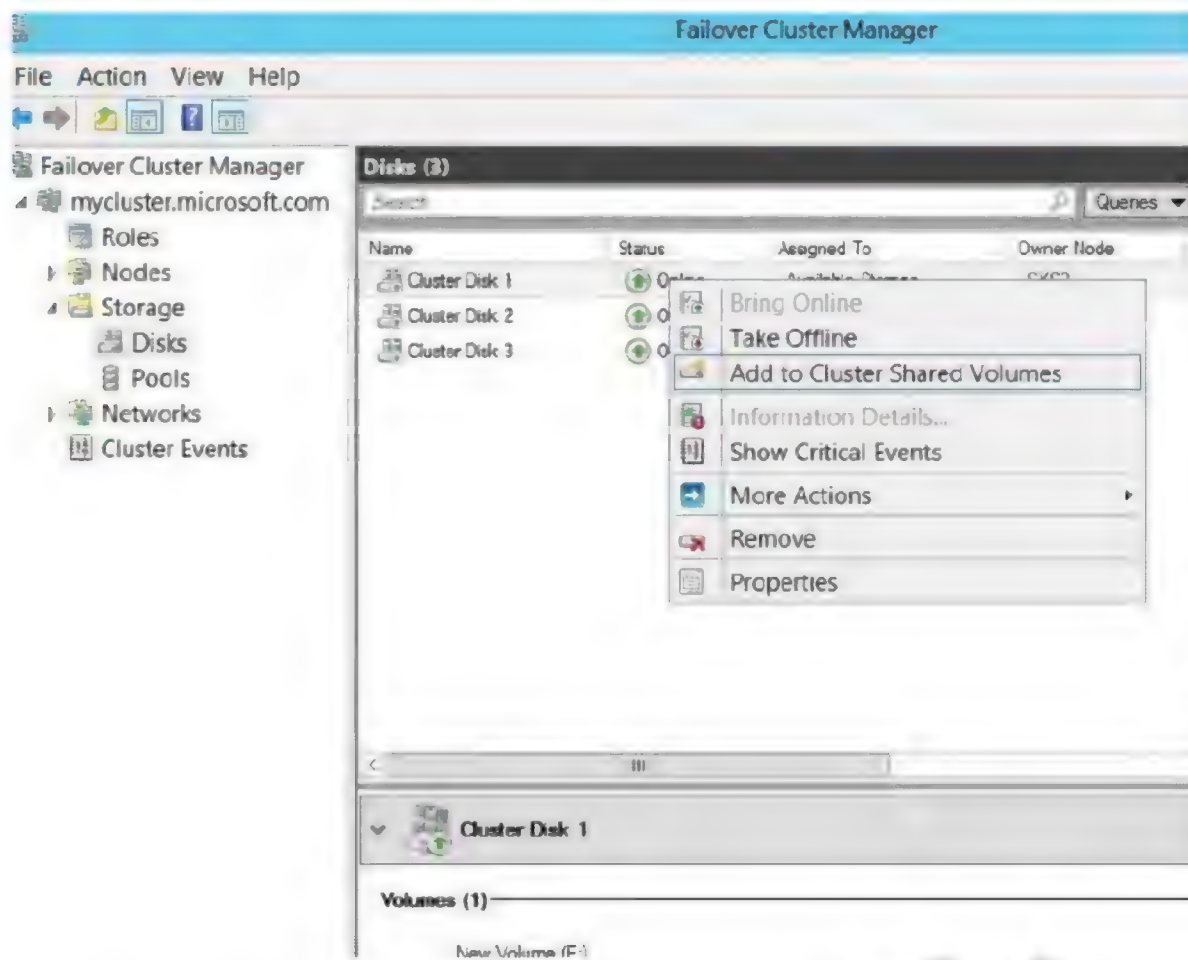


8. Verify **Cluster Disk1, Cluster Disk2 and Cluster Disk3**

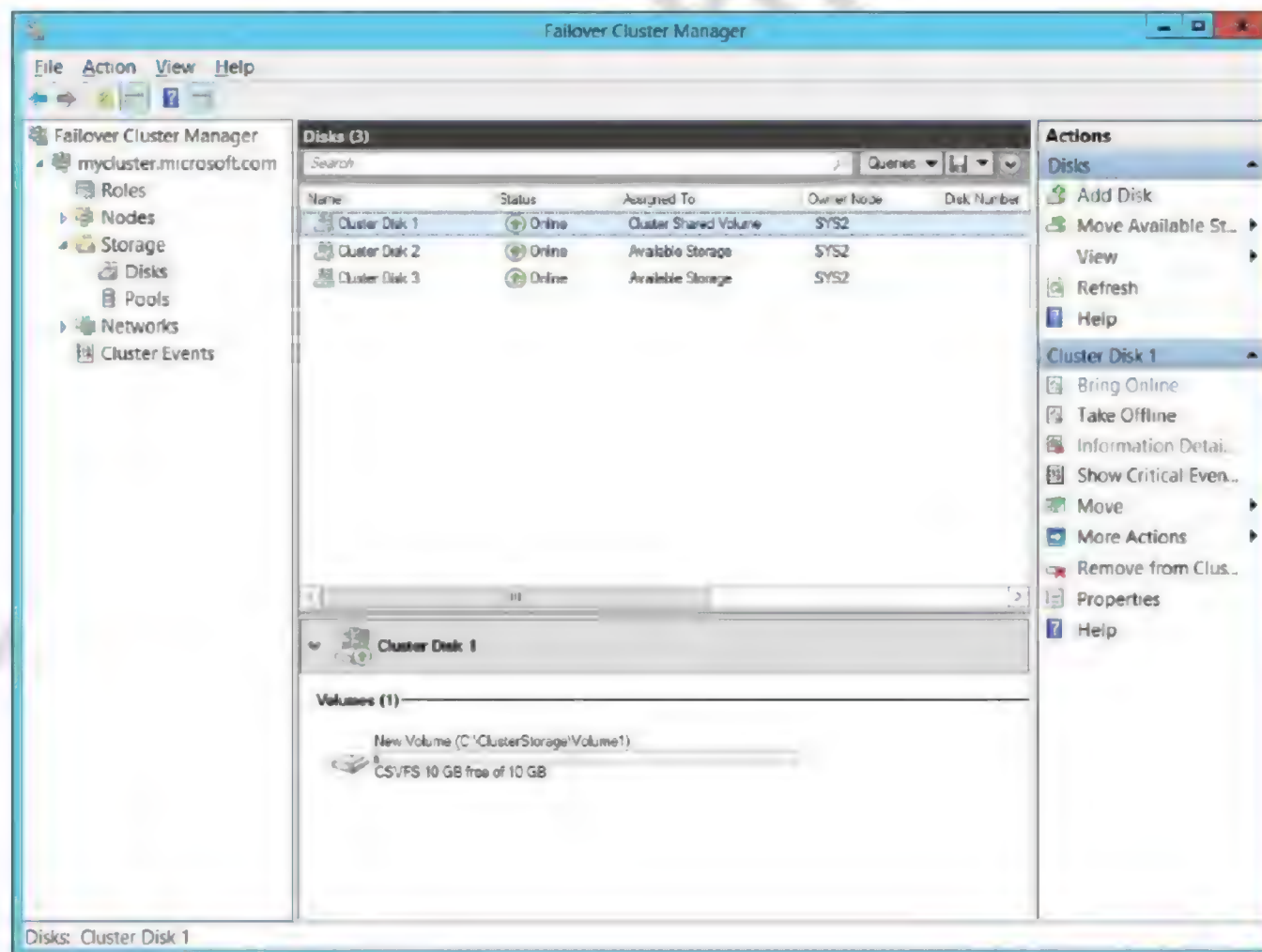




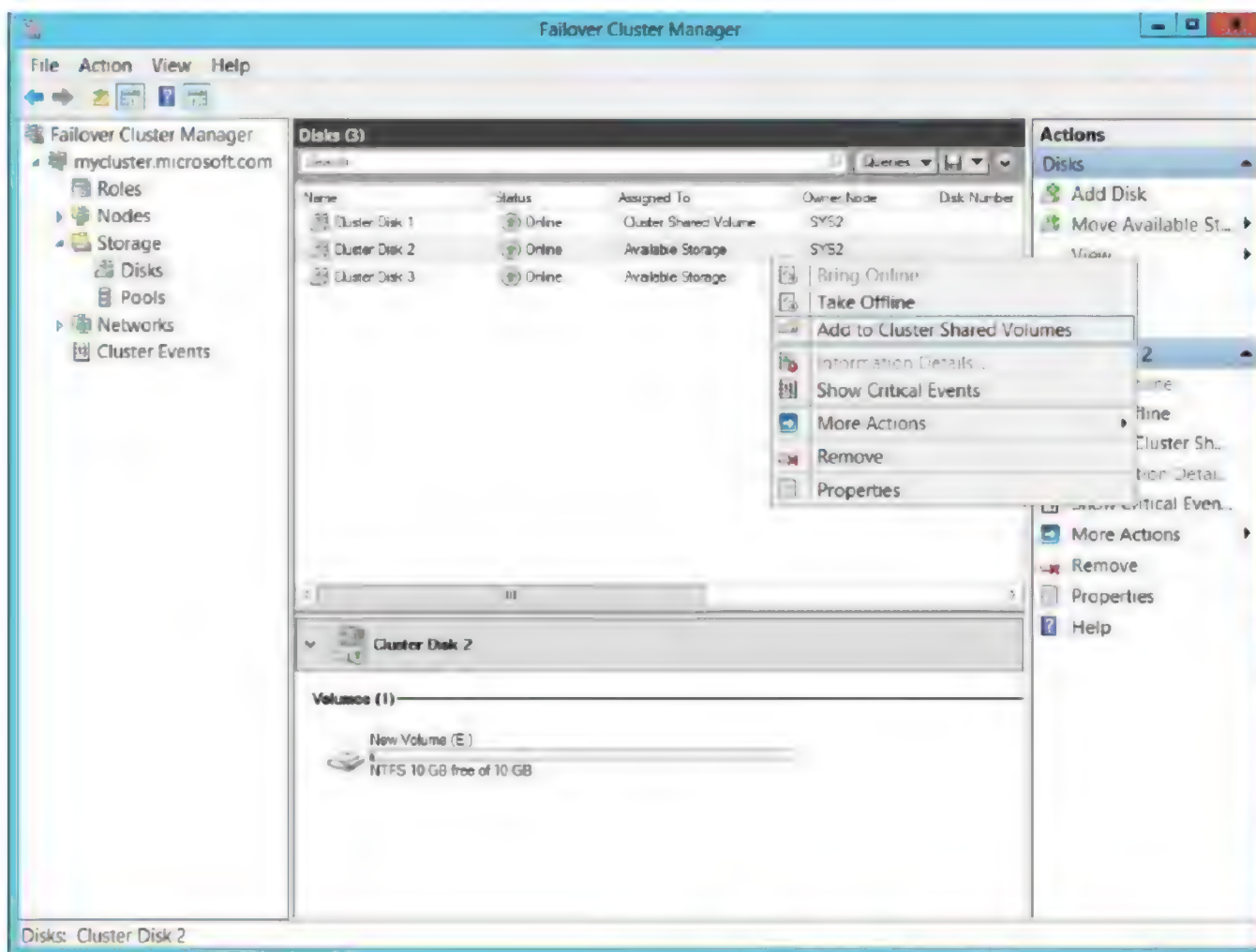
9. Right click **Cluster Disk1** → select **Add to Cluster Shared Volumes**



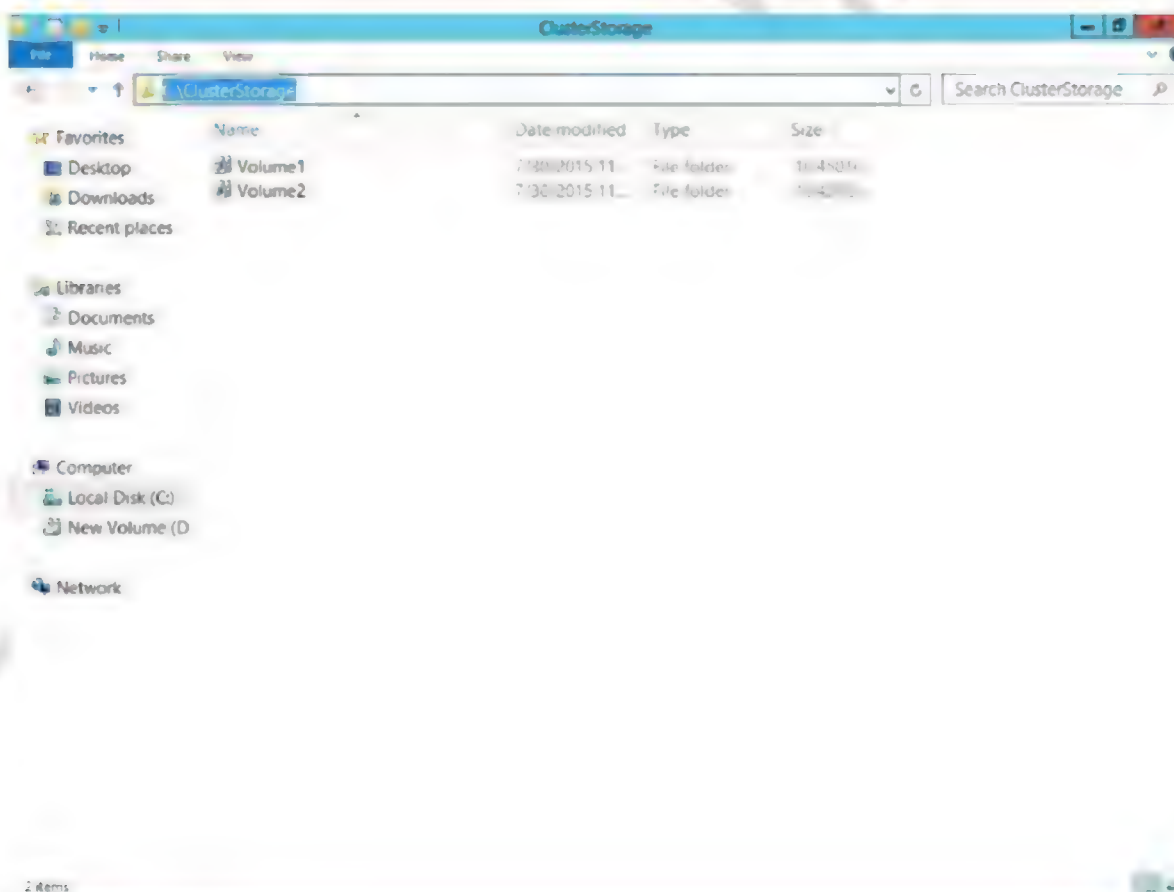
10. Verify **Cluster Disk1** assigned to **Cluster Shared Volume**



11. Repeat same steps on **Cluster Disk2**

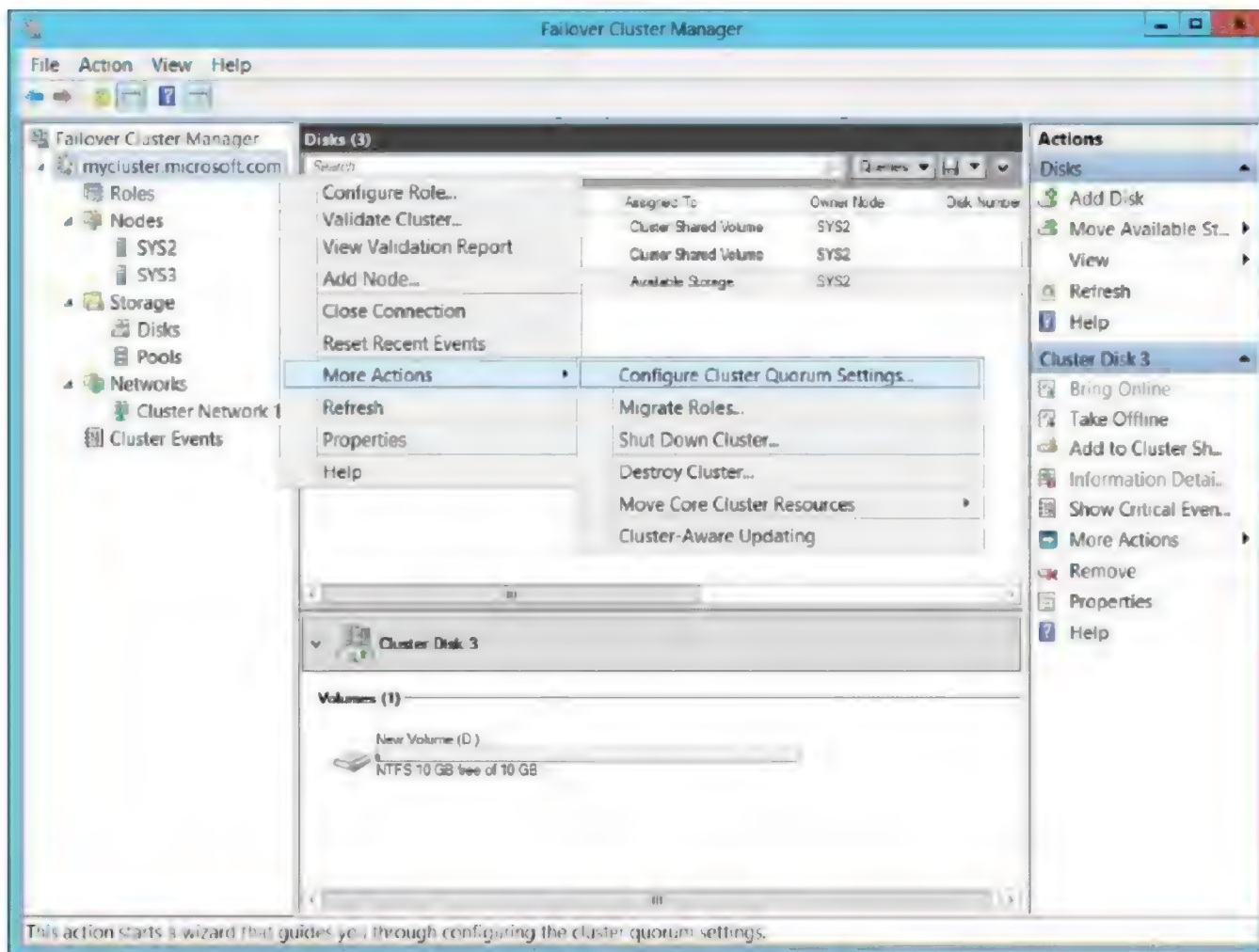


12. In **SYS2** and **SYS3** verify two new Shared Volumes in **C:\ClusterStorage**

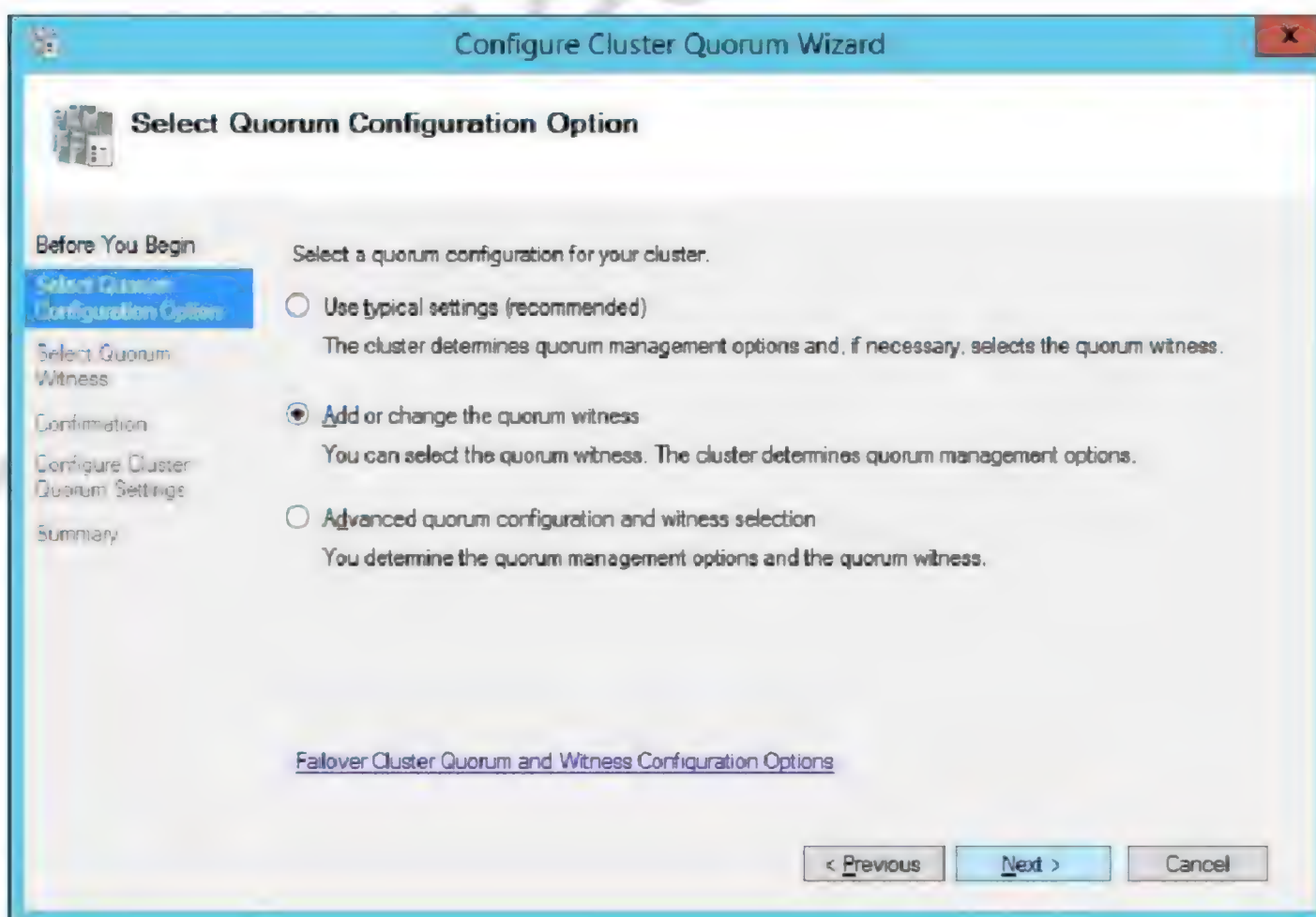




13. In **Failover Cluster Manager** → right click **mycluster.microsoft.com** → click **More Actions** → click **Configure Cluster Quorum Settings**



14. Click **Select Quorum Configuration Option** page → select **add or change the quorum witness** → click **Next**





15. Click **Select Quorum Witness Page**→select **Configure a Disk Witness**

**Configure Cluster Quorum Wizard**

**Select Quorum Witness**

**Before You Begin**  
 Select Quorum Configuration Option  
 Select Quorum Witness  
 Configure Storage Witness  
 Confirmation  
 Configure Cluster Quorum Settings  
 Summary

Nodes that are configured to be members of the cluster: 2  
 Nodes that are assigned votes to participate in quorum calculations: 2  
 Cluster dynamically manages vote assignment: Enabled

Select to add or change the quorum witness for your cluster configuration. The recommendations are based on providing the highest availability for your cluster.

☒ **Configure a disk witness** (recommended for your current configuration)  
 Adds a quorum vote of the disk witness

☐ **Configure a file share witness** (recommended for special configurations)  
 Adds a quorum vote of the file share witness

☐ **Do not configure a quorum witness** (not recommended for your current configuration)

[Failover Cluster Quorum and Witness Configuration Options](#)

< Previous   Next >   Cancel

16. Click **Configure Storage Witness Page**→check the box for **Cluster Disk3**

**Configure Cluster Quorum Wizard**

**Configure Storage Witness**

**Before You Begin**  
 Select Quorum Configuration Option  
 Select Quorum Witness  
 Configure Storage Witness  
 Confirmation  
 Configure Cluster Quorum Settings  
 Summary

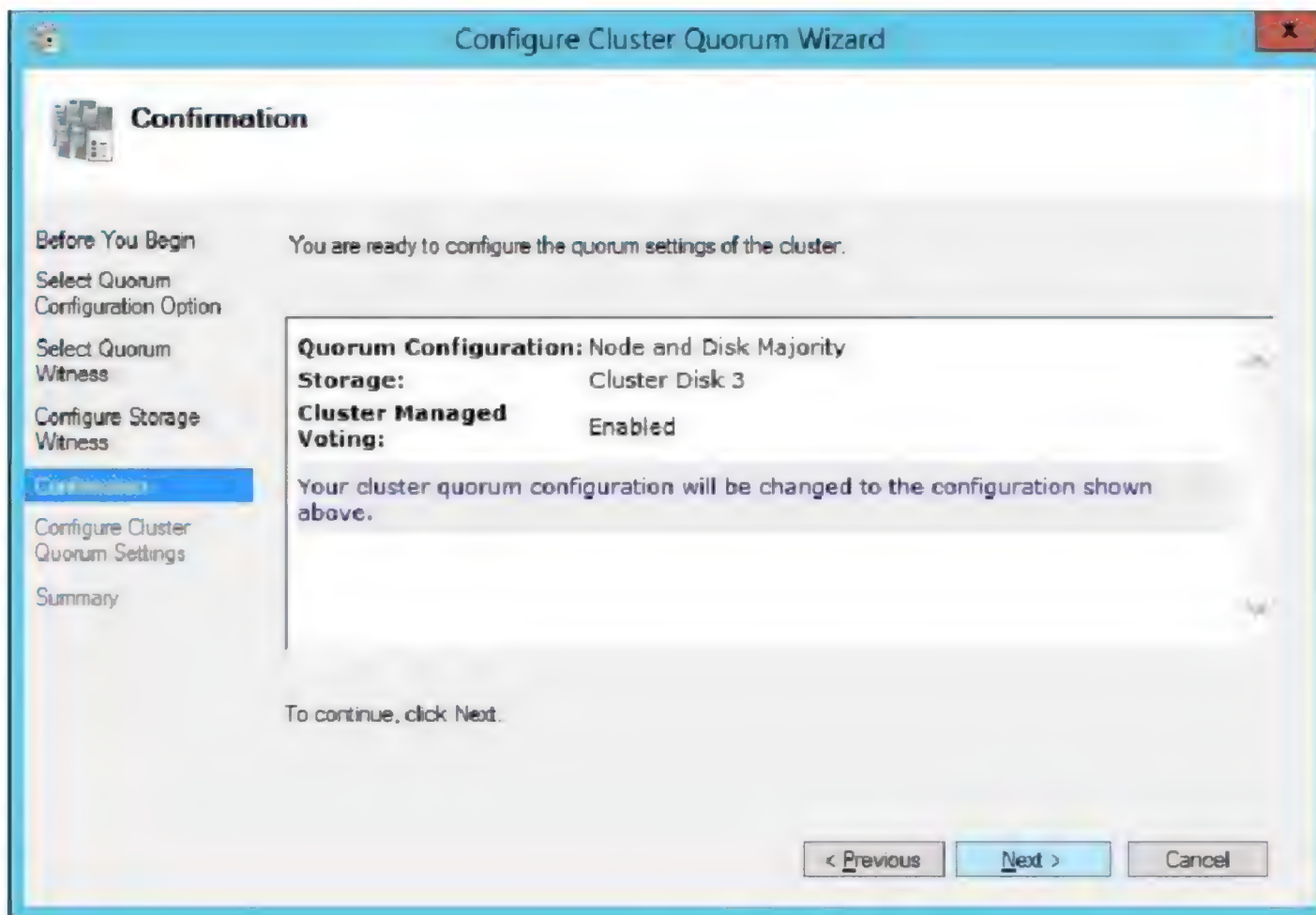
Select the storage volume that you want to assign as the disk witness.

Name	Status	Node	Location
<input checked="" type="checkbox"/> Cluster Disk 3	Online	SYS2	Available Storage

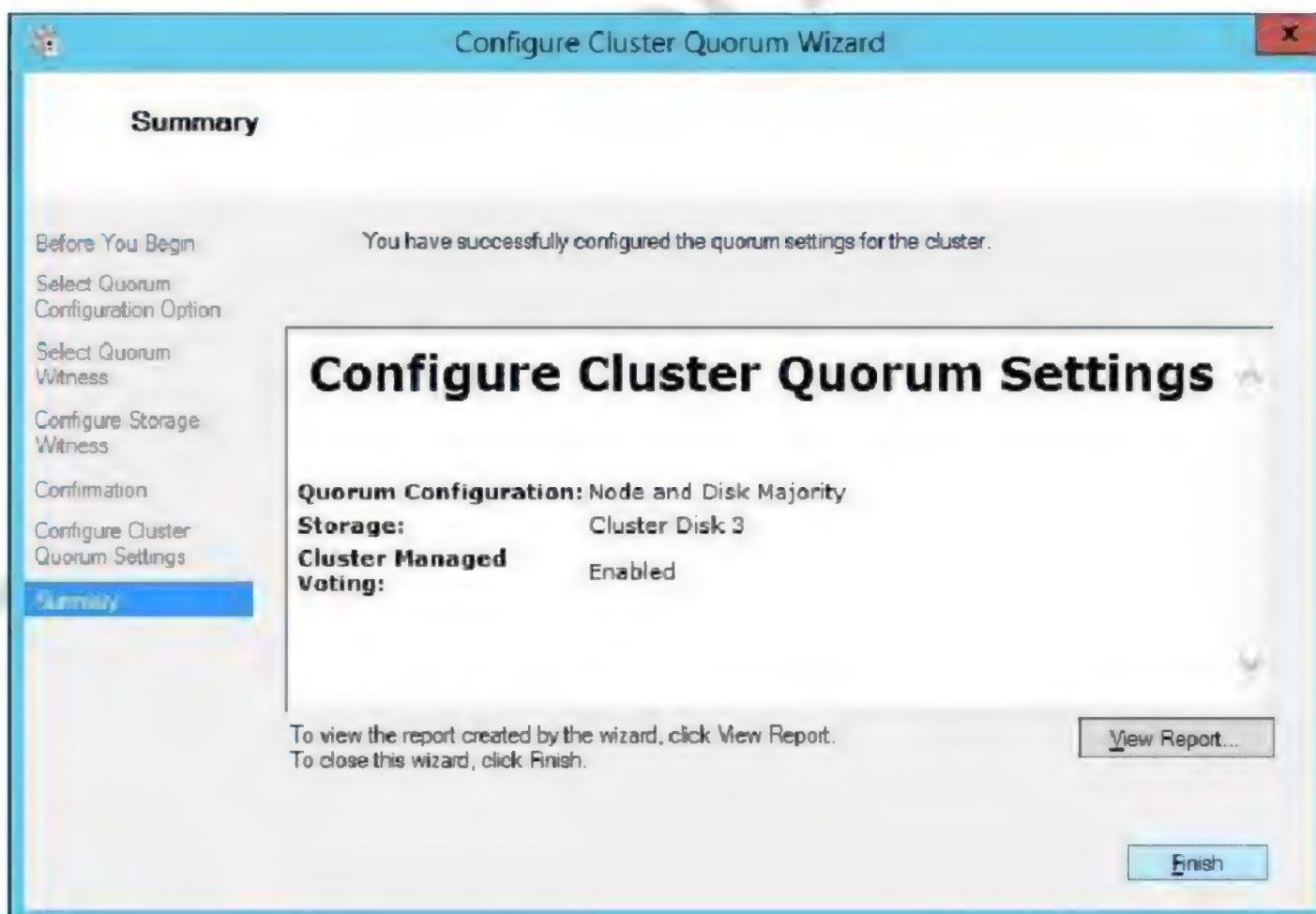
Some storage resources are not listed because they do not support being the quorum storage or they are not online.

< Previous   Next >   Cancel

17. Click **Next**

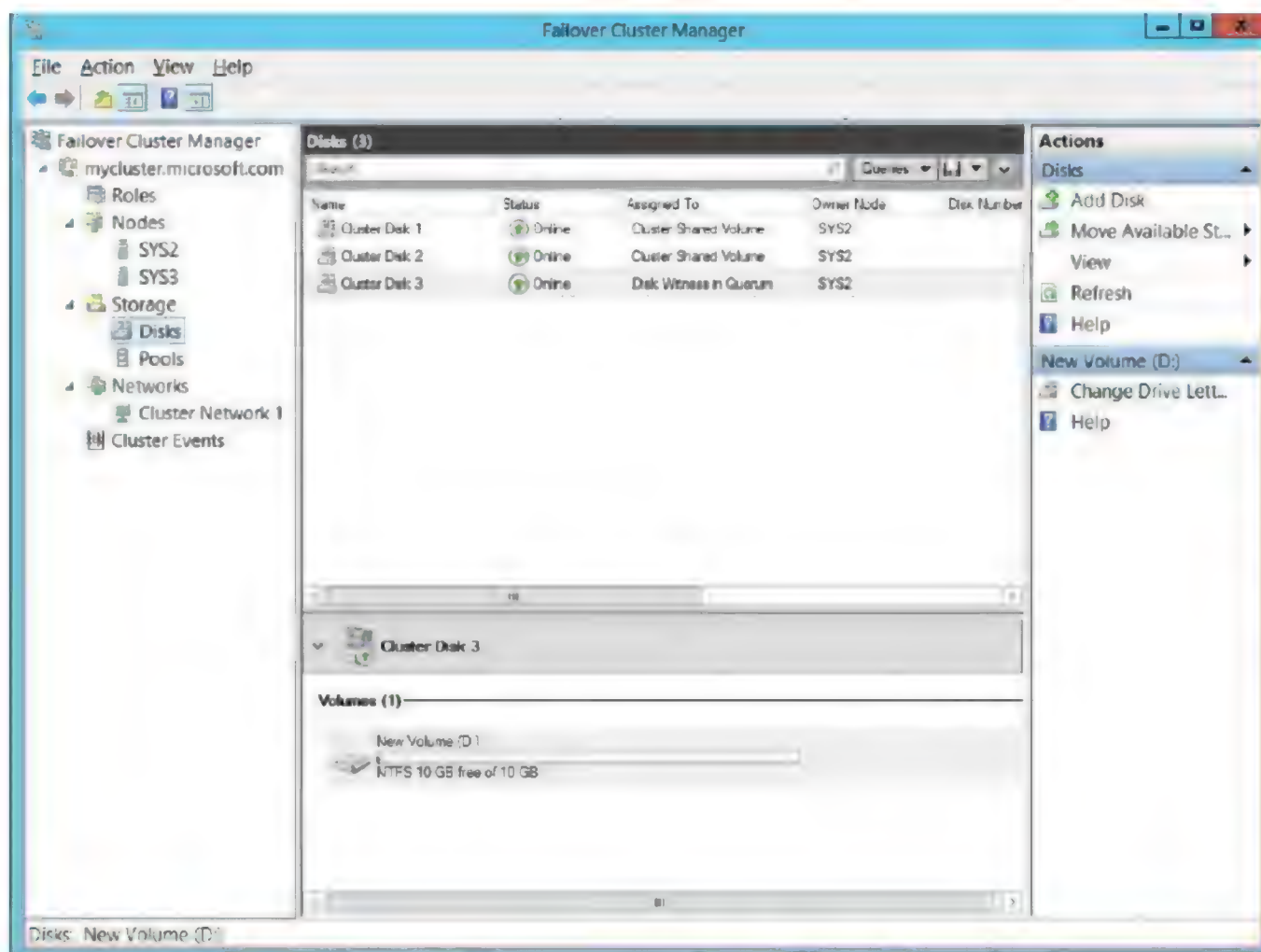


18. Click **Finish**



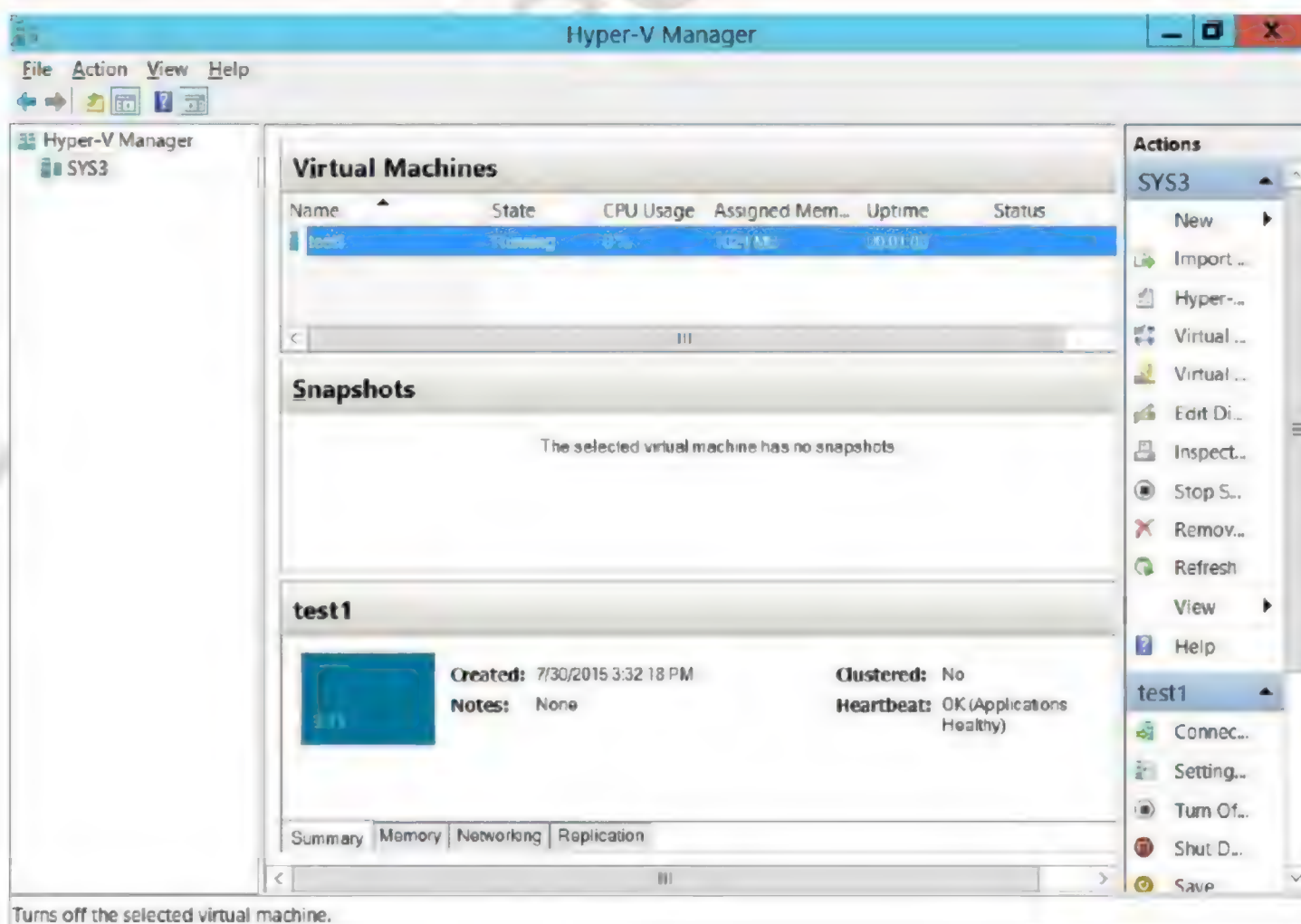


19. Verify Three Disks in Failover Cluster Manager as below



19. Install Hyper-VRole in SYS2 and SYS3

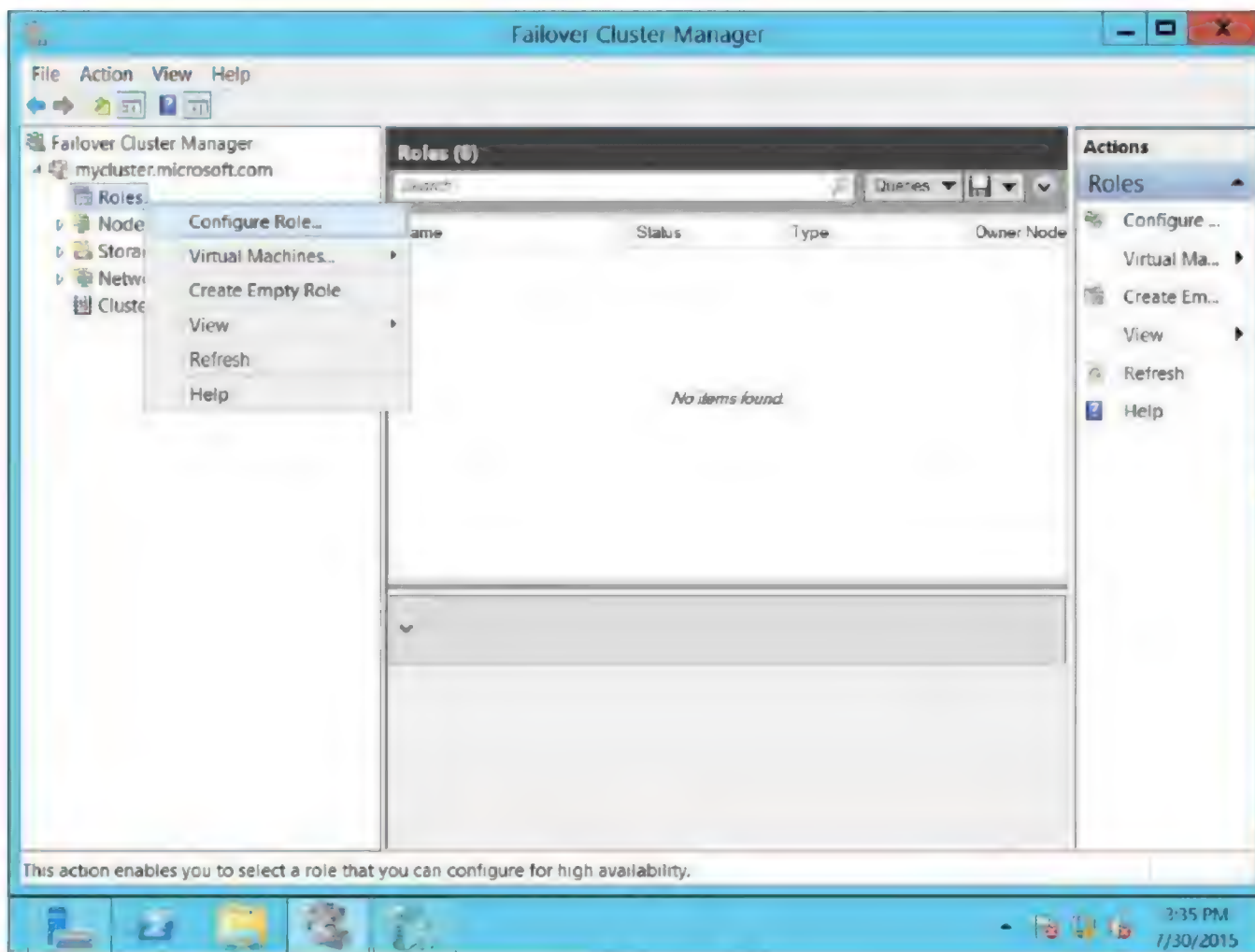
20. In SYS3 create a new Virtual Machine(Ex: Test1)



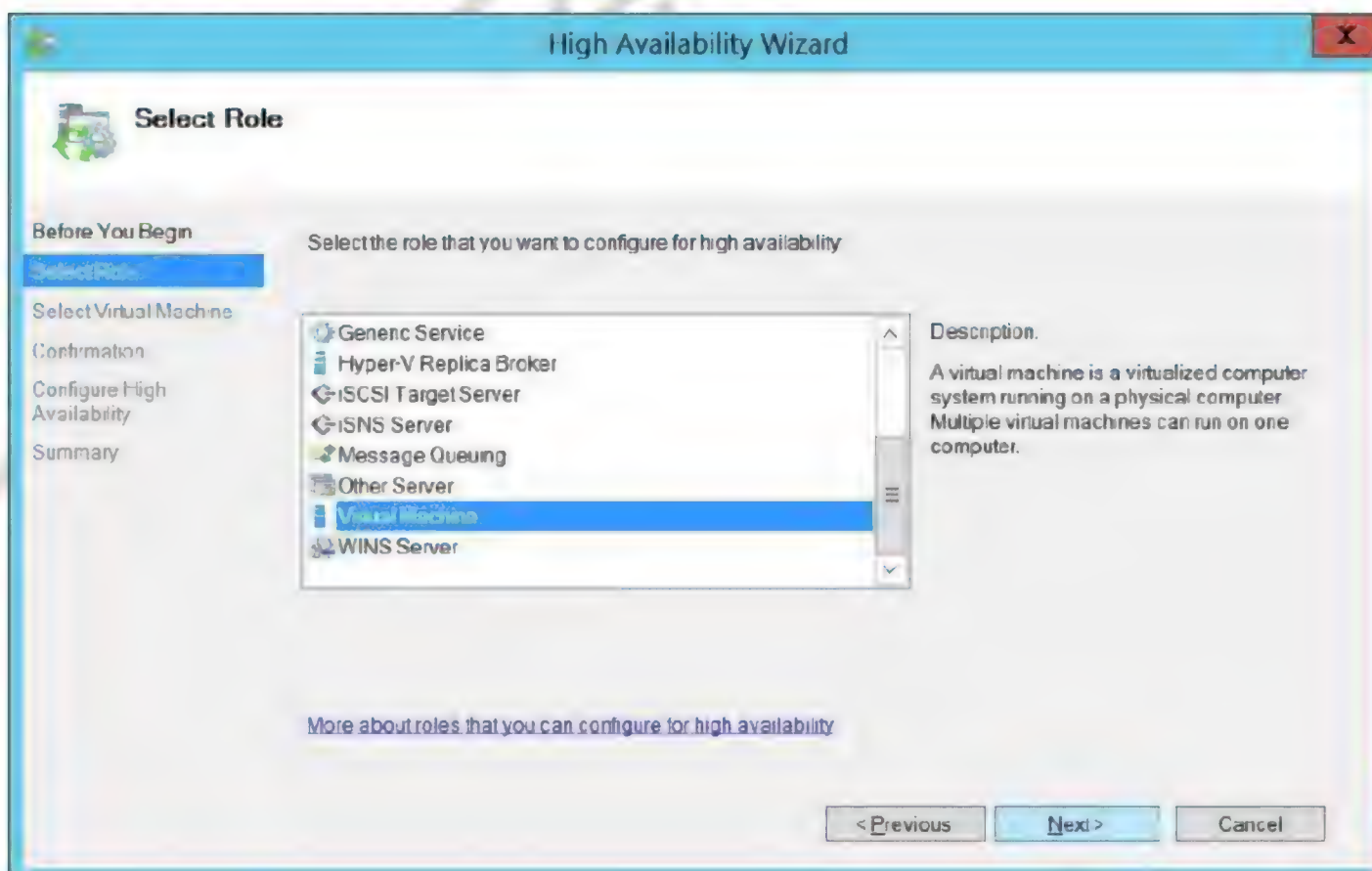


## Configuring Roles

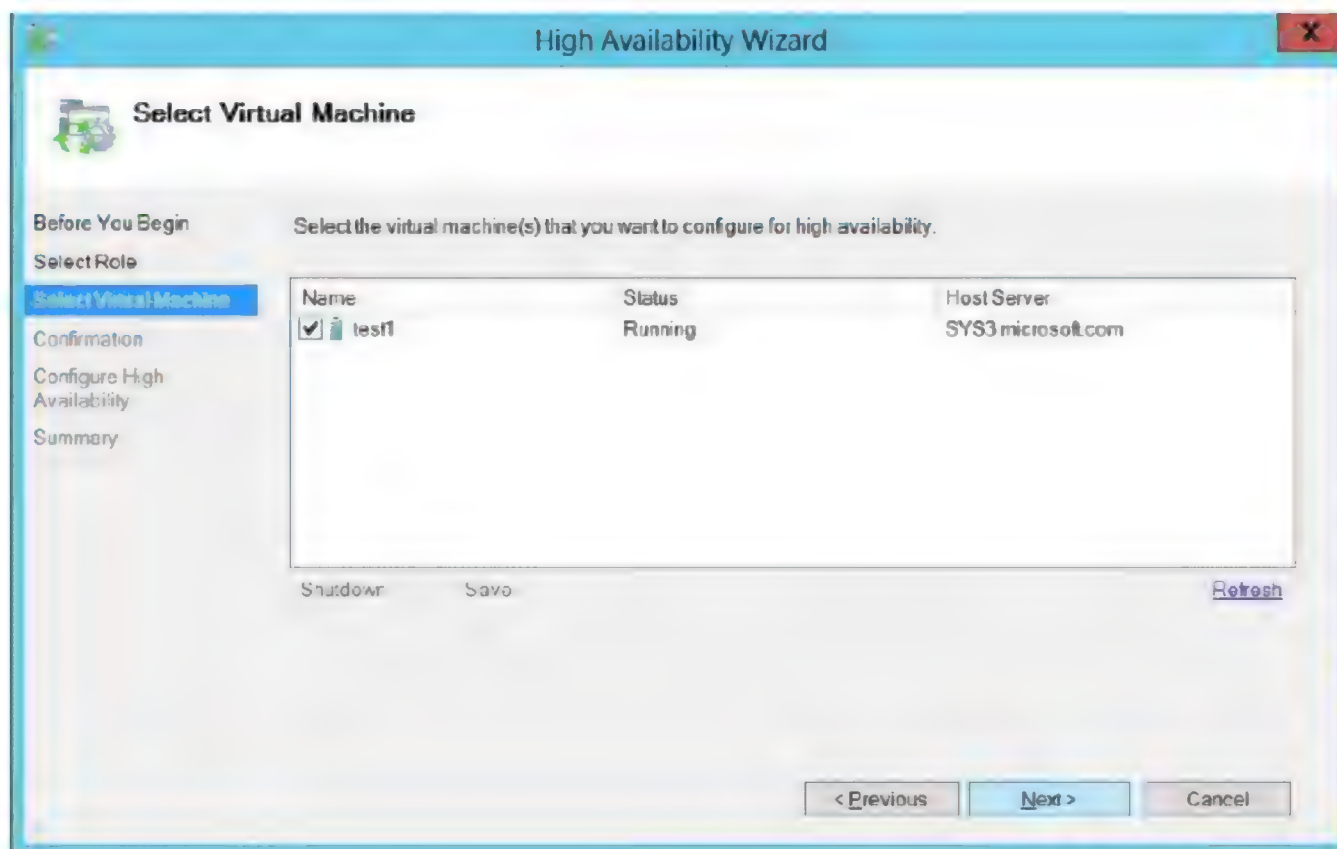
1. In **Failover Cluster Manager** → expand **mycluster.microsoft.com** → right click **Roles** → click **Configure Role**



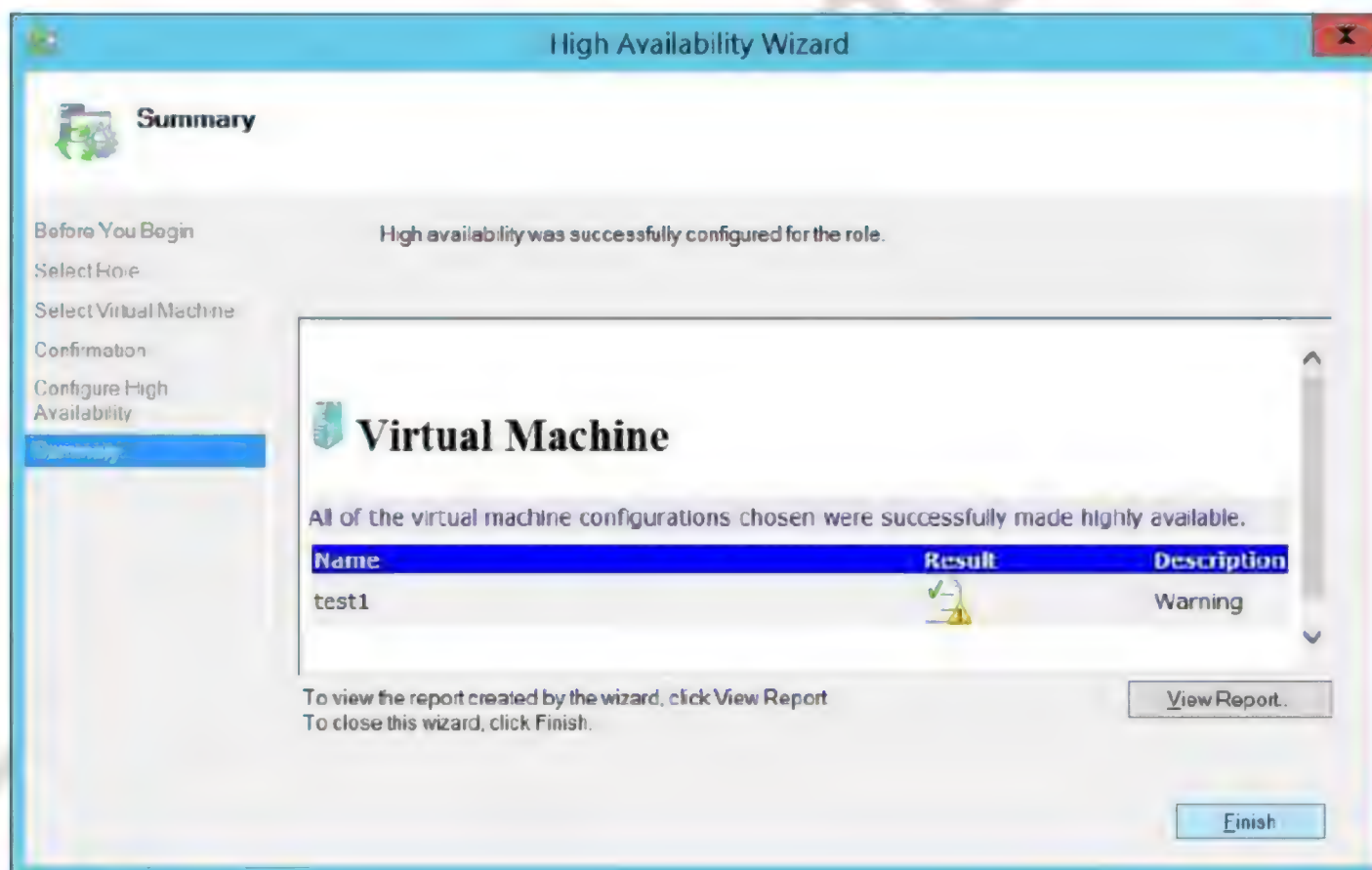
2. Select **Virtual Machine** → click **Next**



3. Check the box **Test1** → click **Next**

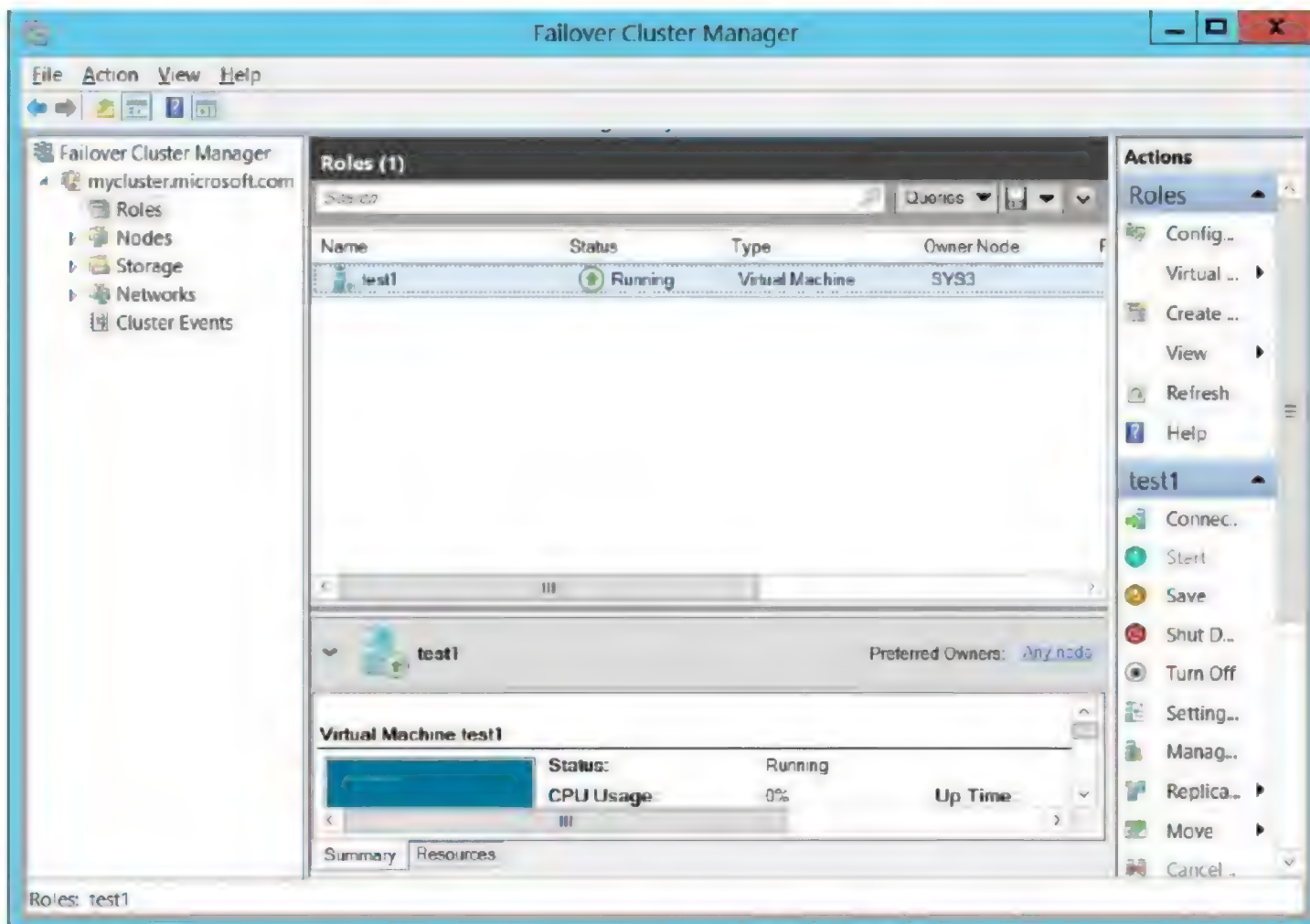


4. Click **Finish**

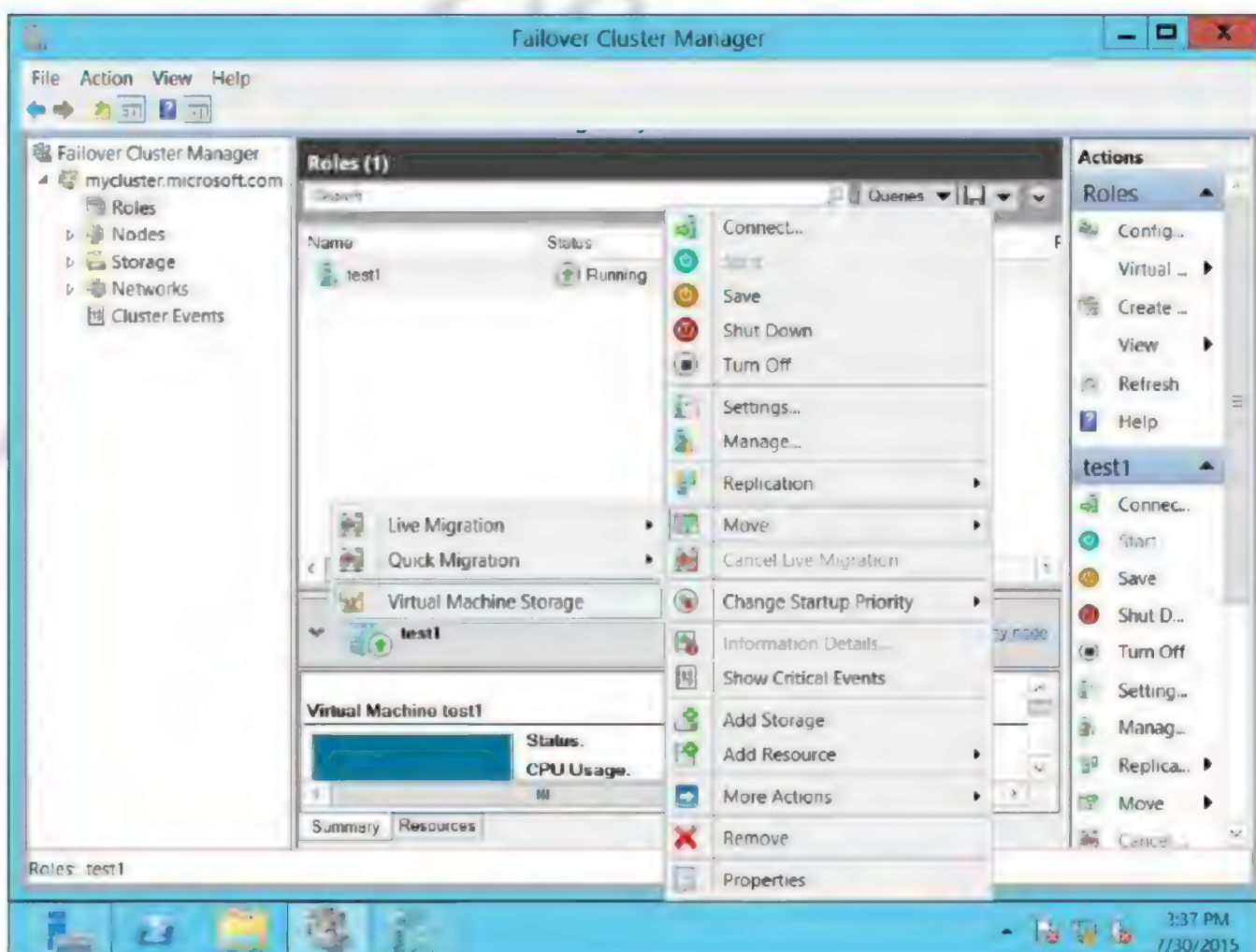




5. In Failover Cluster Manager → Verify Test1 under Roles and Owner Node SYS3

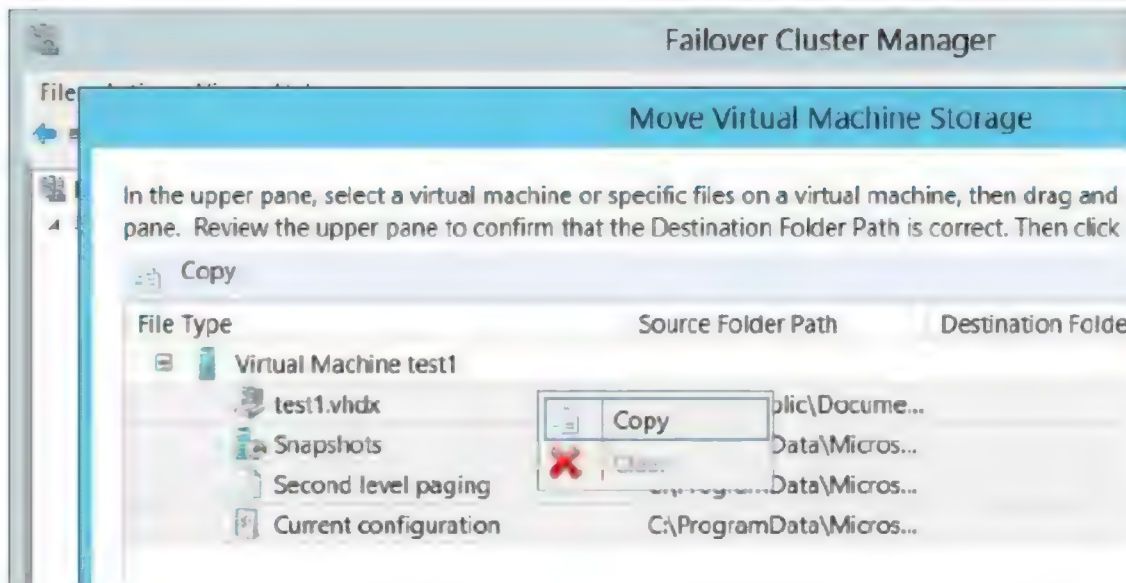


6. In Failover Cluster Manager → expand mycluster.microsoft.com → select Roles → under Roles right click Test1 → click Move → select Virtual Machine Storage

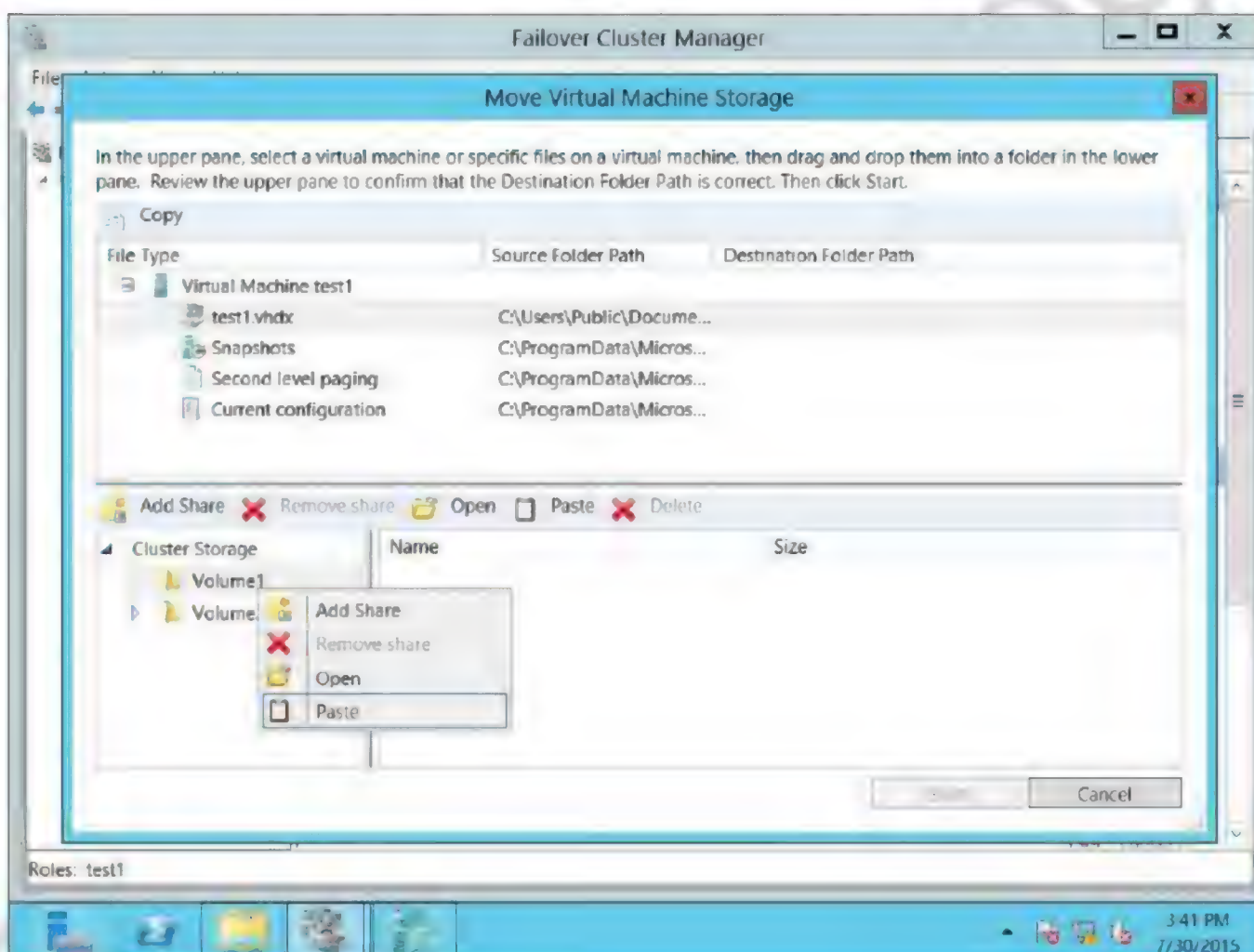




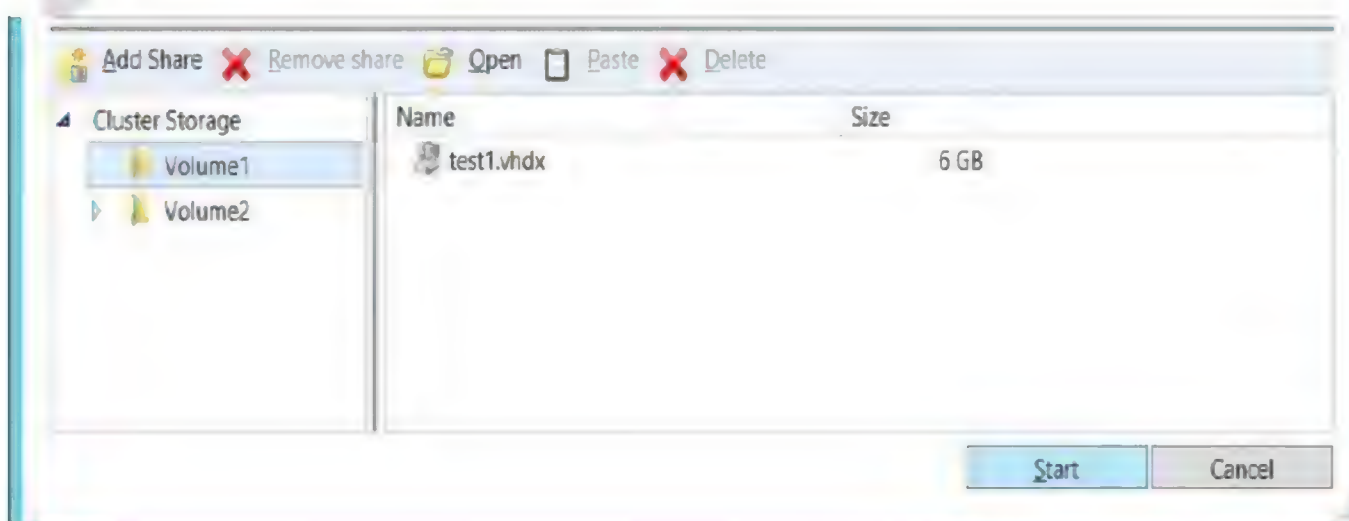
7. In **Move Virtual Machine Storage Page** → expand **Virtual Machine Test1** → right click **Test1** → click **Copy**



8. In **Cluster Storage** → select **Volume1** → right click → click **Paste**



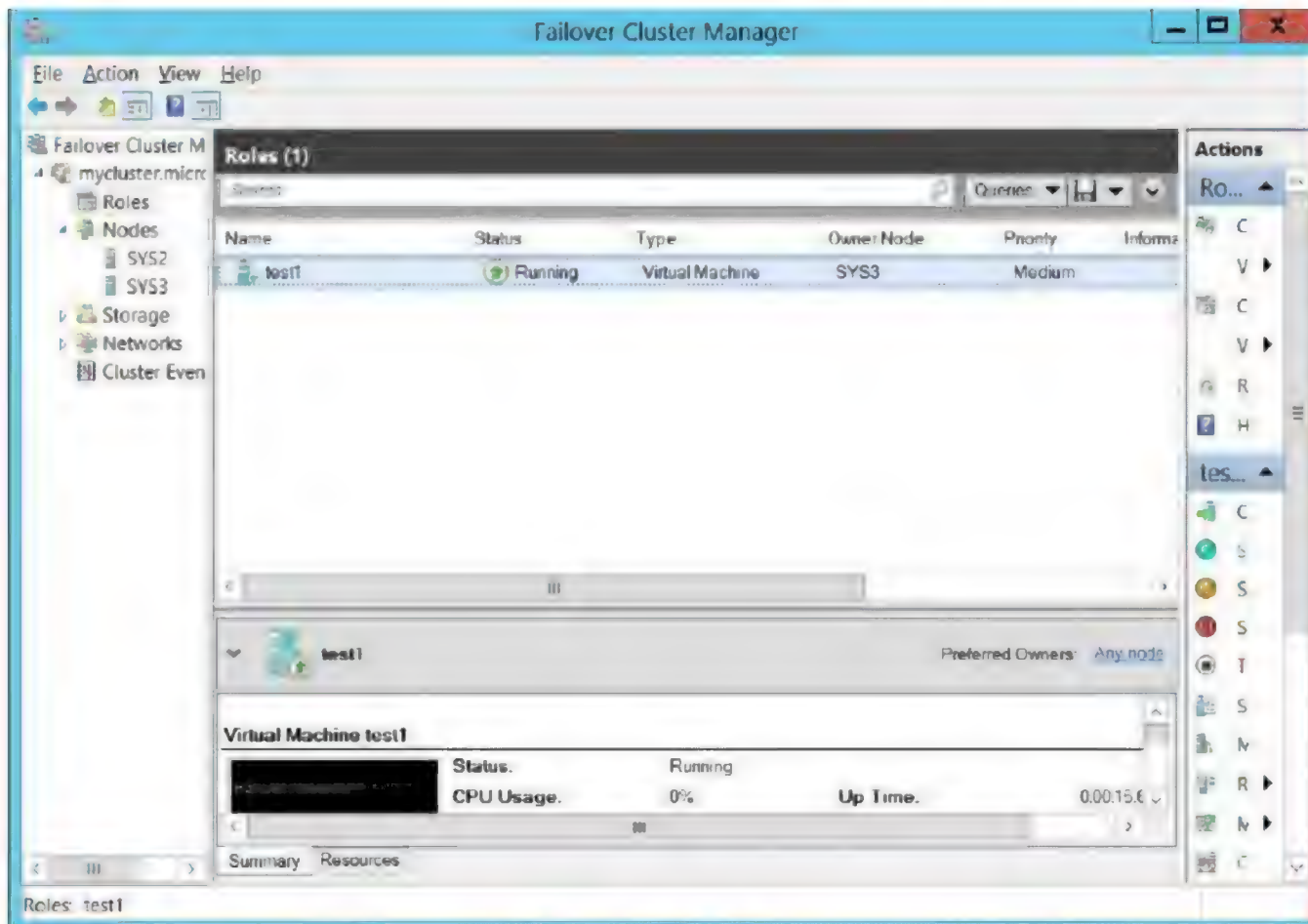
9. Verify **test1.vhdx** in **Volume1**



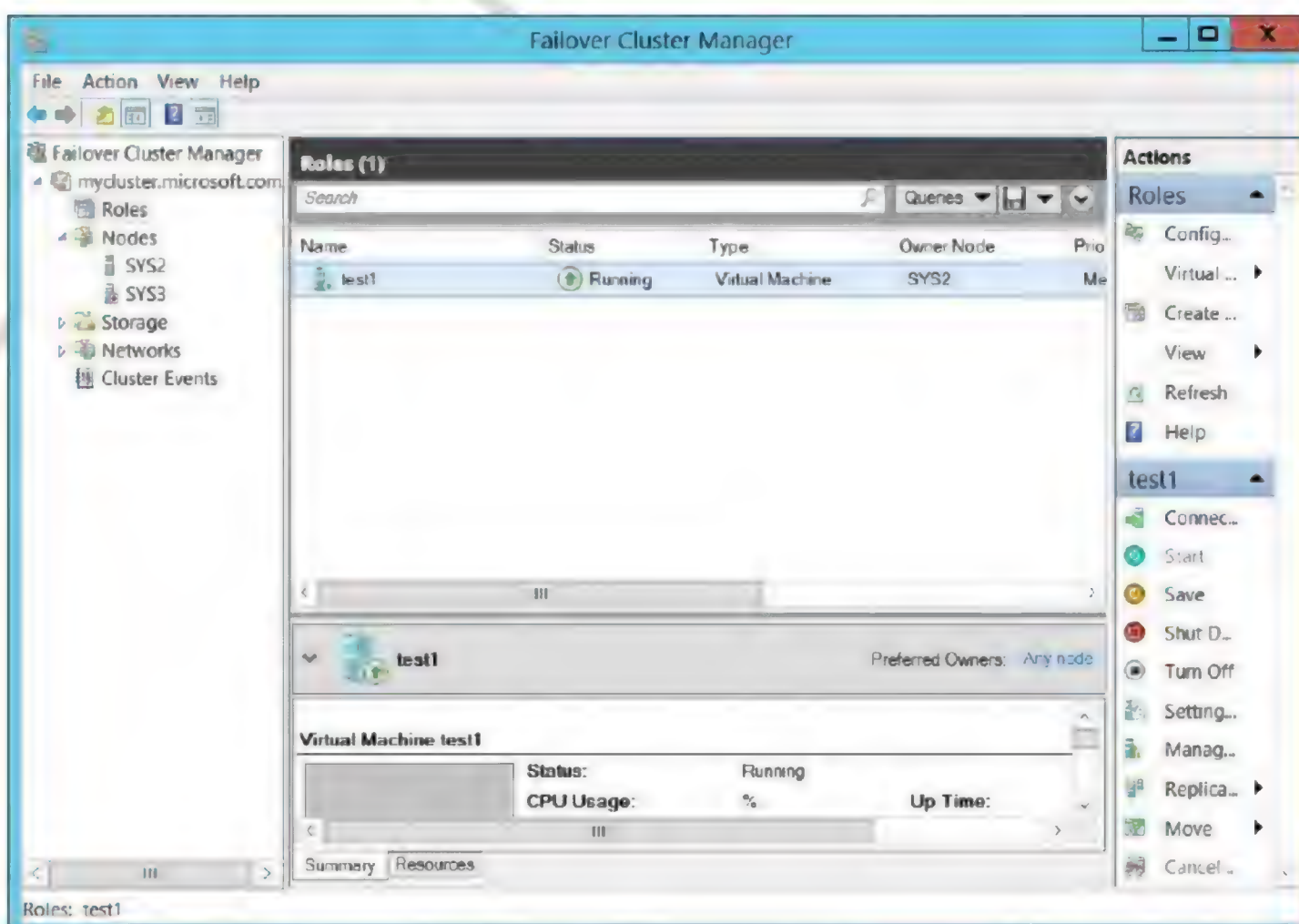
## Verification:

### Quick Migration

1. In **SYS2** open Failover Cluster Manager → expand **mycluster.microsoft.com** → select **Roles** → under Roles verify **Test1 Owner Node is SYS3**



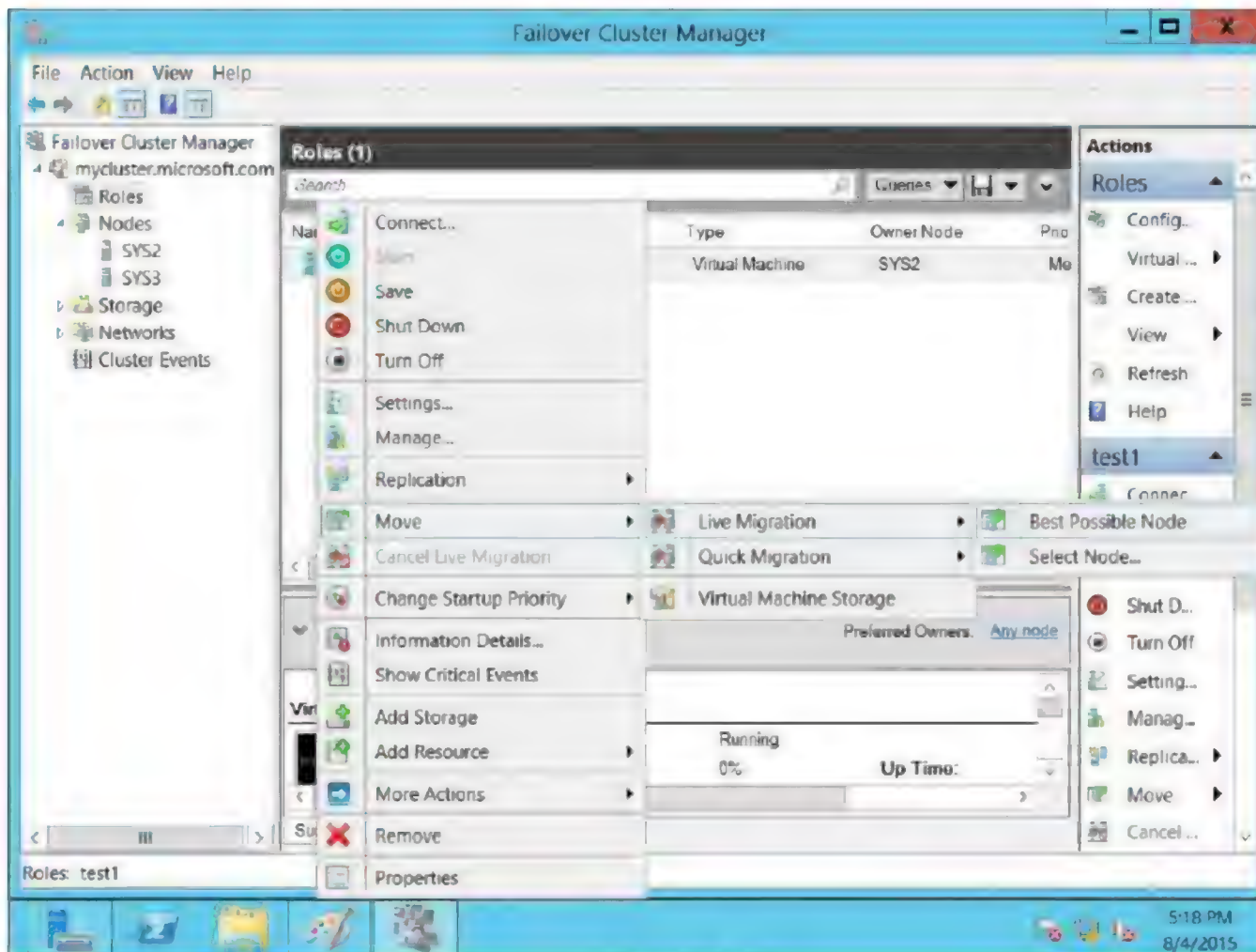
2. Disable **SYS3** Lan Card → in **SYS2** open **Failover Cluster Manager** → under roles verify **Test1OwnerNode** becoming from **SYS3** to **SYS2** automatically.



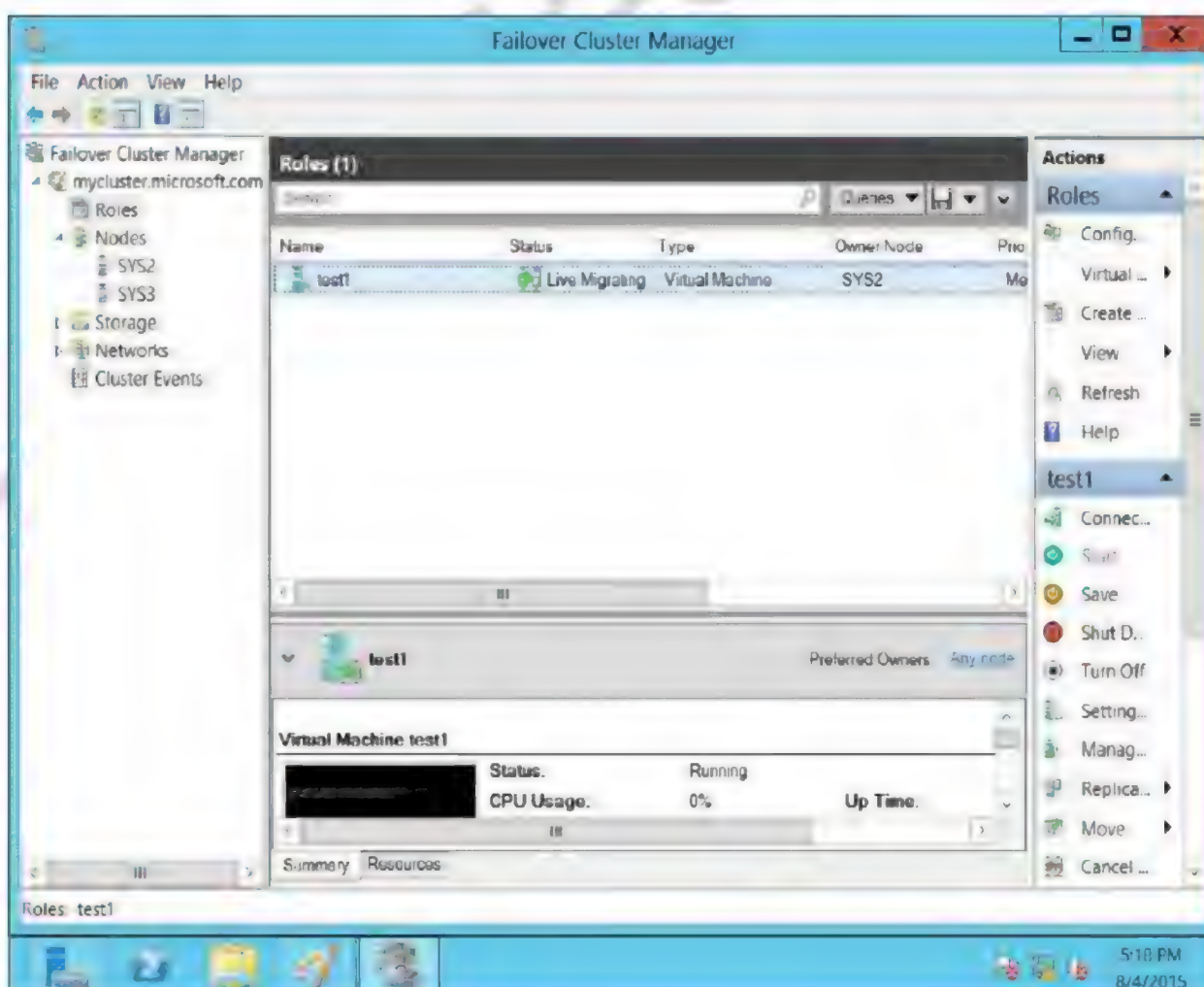


## Live Migration

3. In **SYS2** open **Failover Cluster Manager** → click **Roles** → right click **Test1** → click **Move** → click **Live Migration** → select **Best Possible Node**



4. Verify **Test1** status and **Owner Mode** changes to **SYS3**





## Lab – 82: Configuring Windows Server Backup and Recovery

### Objective:

To Protect files by taking backup using Windows Server Backup

### Prerequisites:

Before working on this lab, you must have

- A Computer with Windows Server 2012 Domain Controller

### Topology:



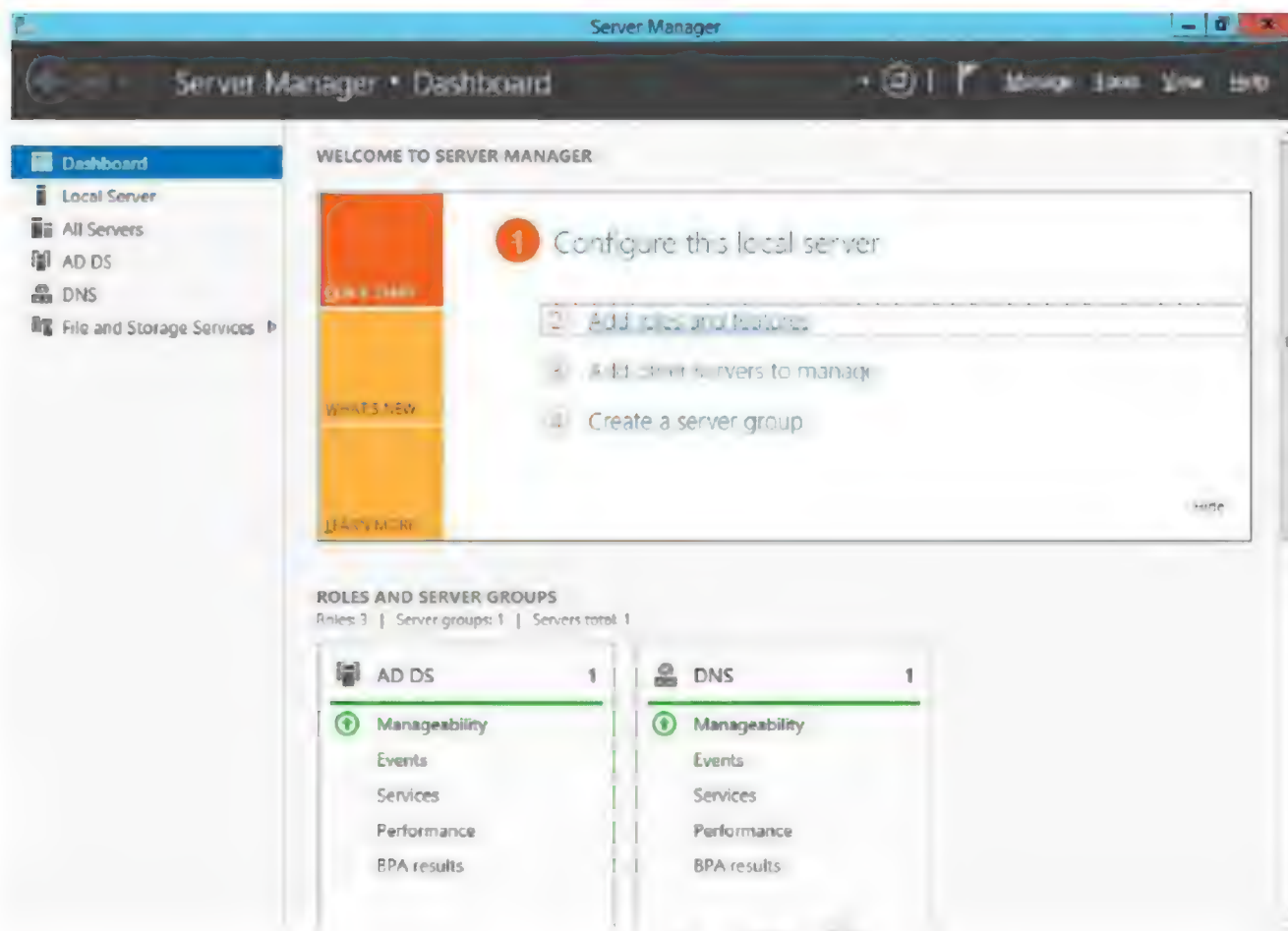
#### SYS1

##### Domain Controller

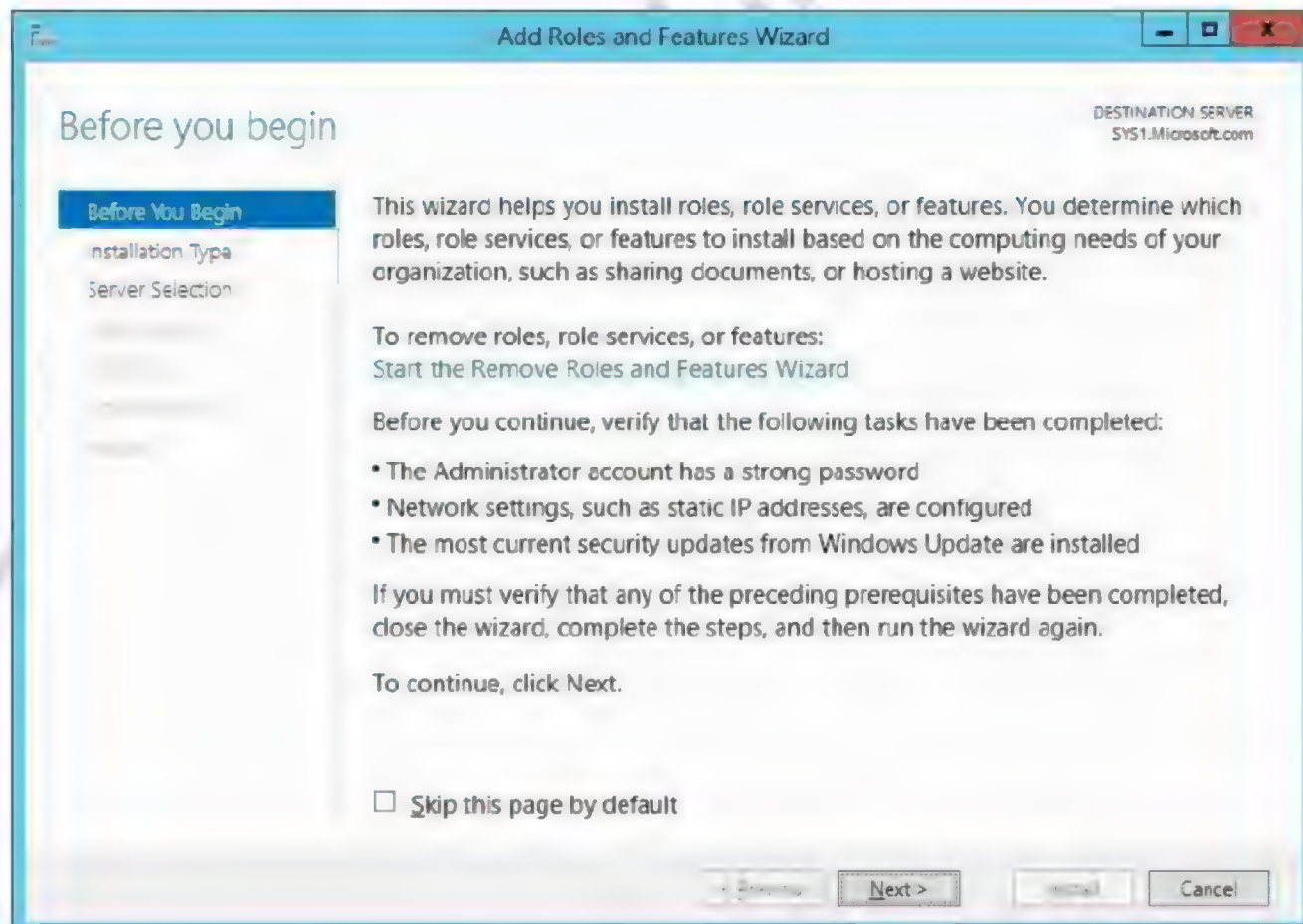
IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

## Installing Windows Server Backup

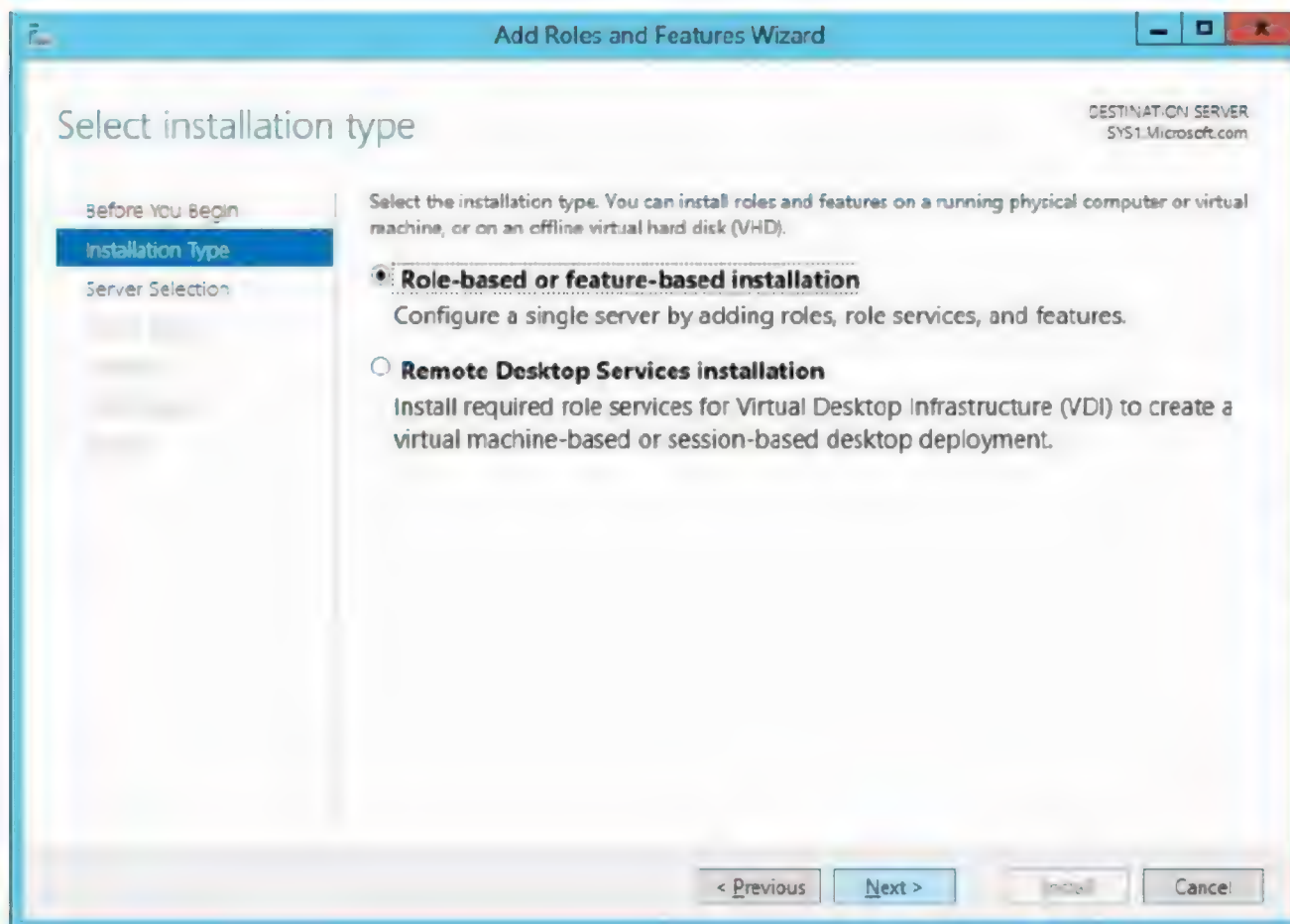
1. Login as **Administrator**, go to ServerManager Dashboard and click **Add roles and features**.



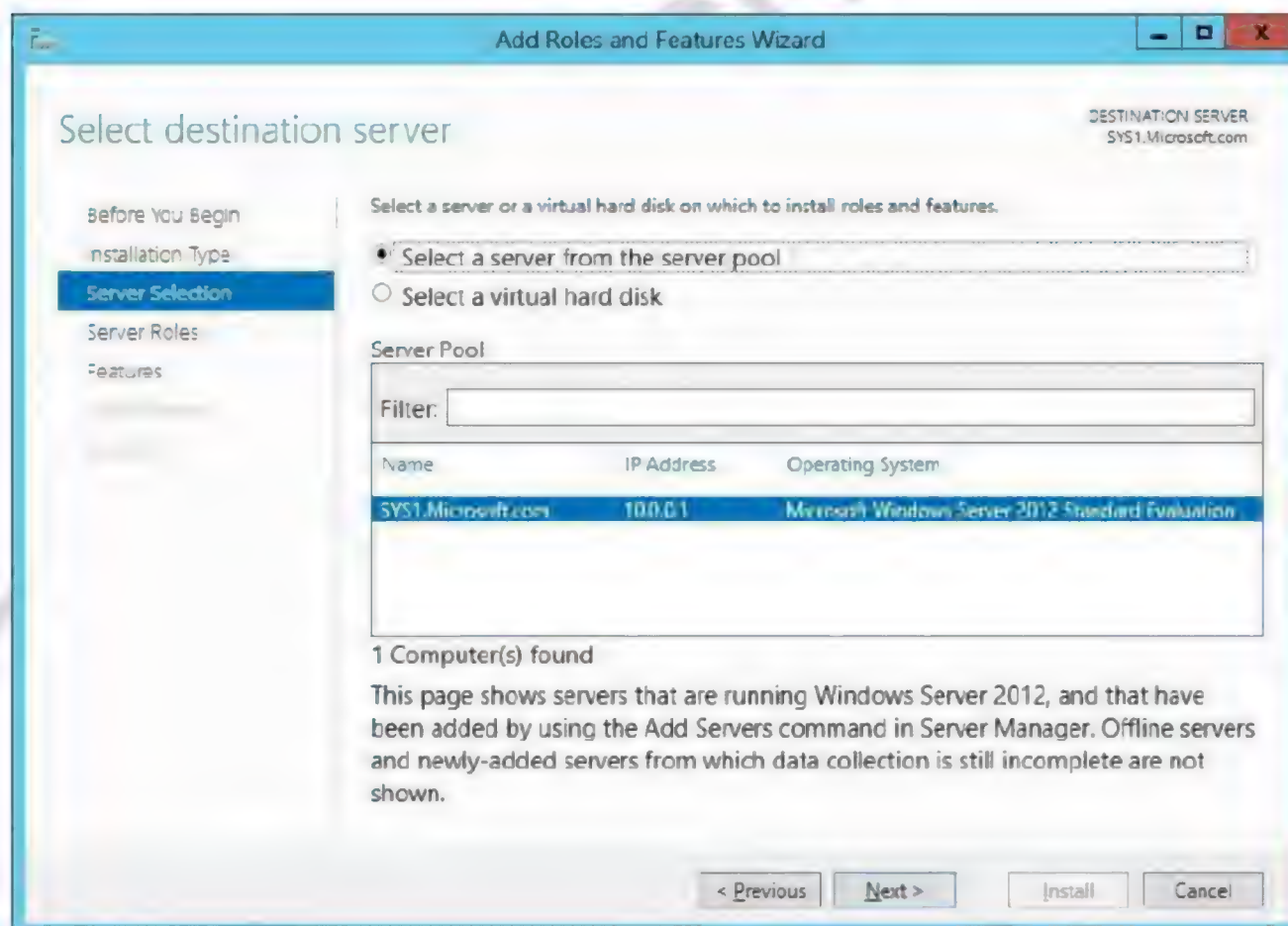
2. In Before you begin page, click **Next**.



3. Select **Role-based or feature-based installation**, click **Next**.

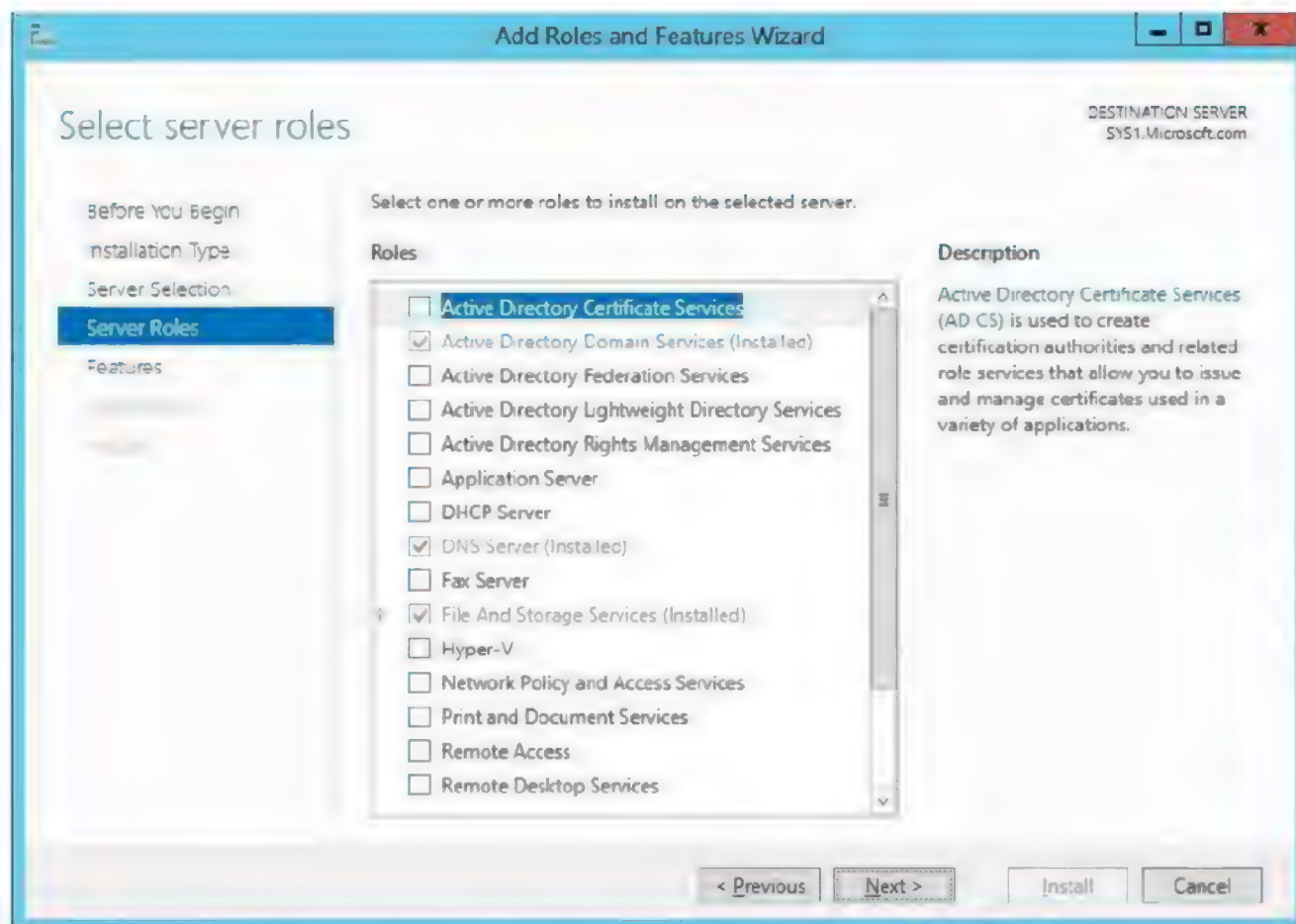


4. In Select destination server page, select a server (**SYS1.Microsoft.com**) from the server pool and click **Next**.

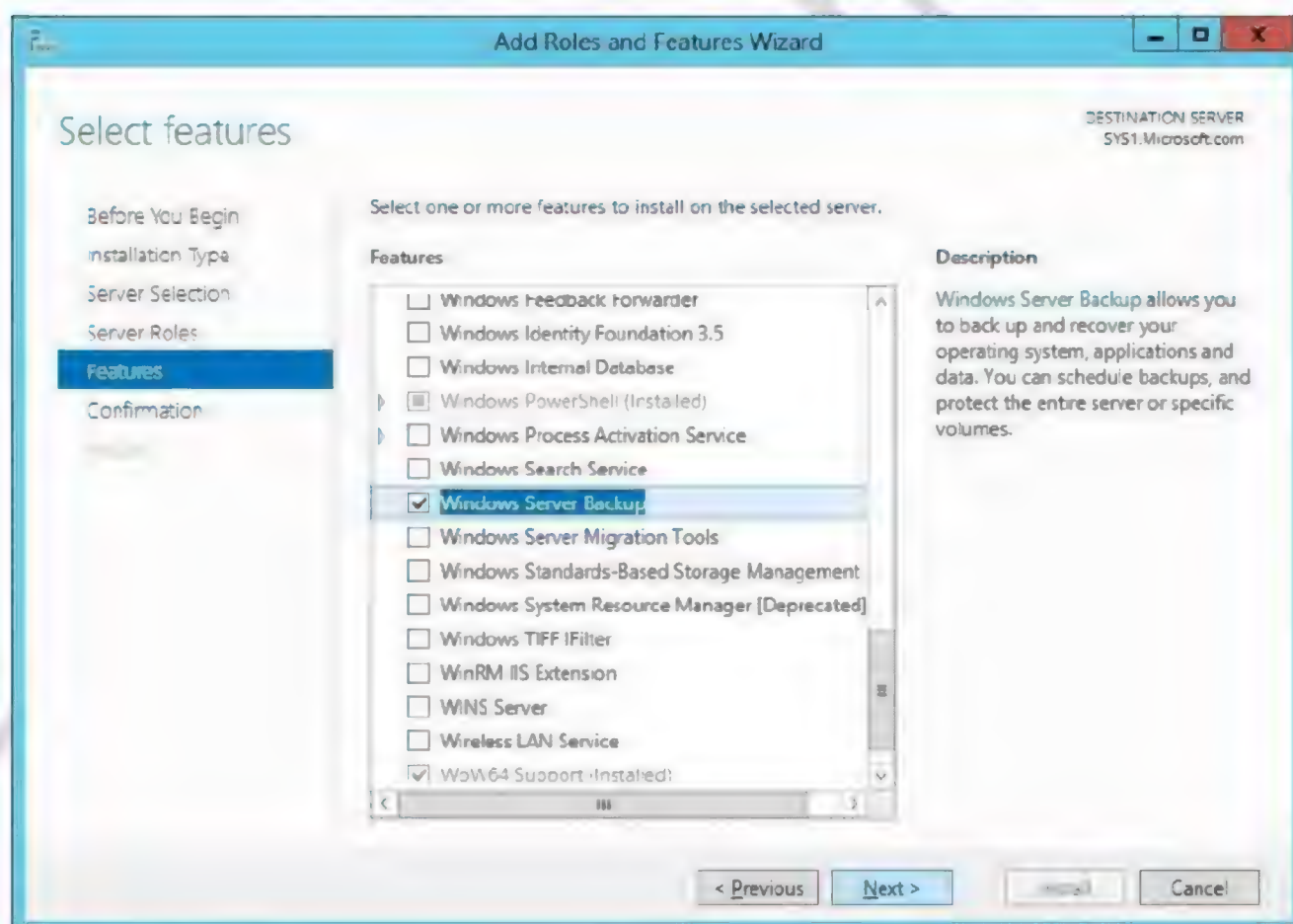




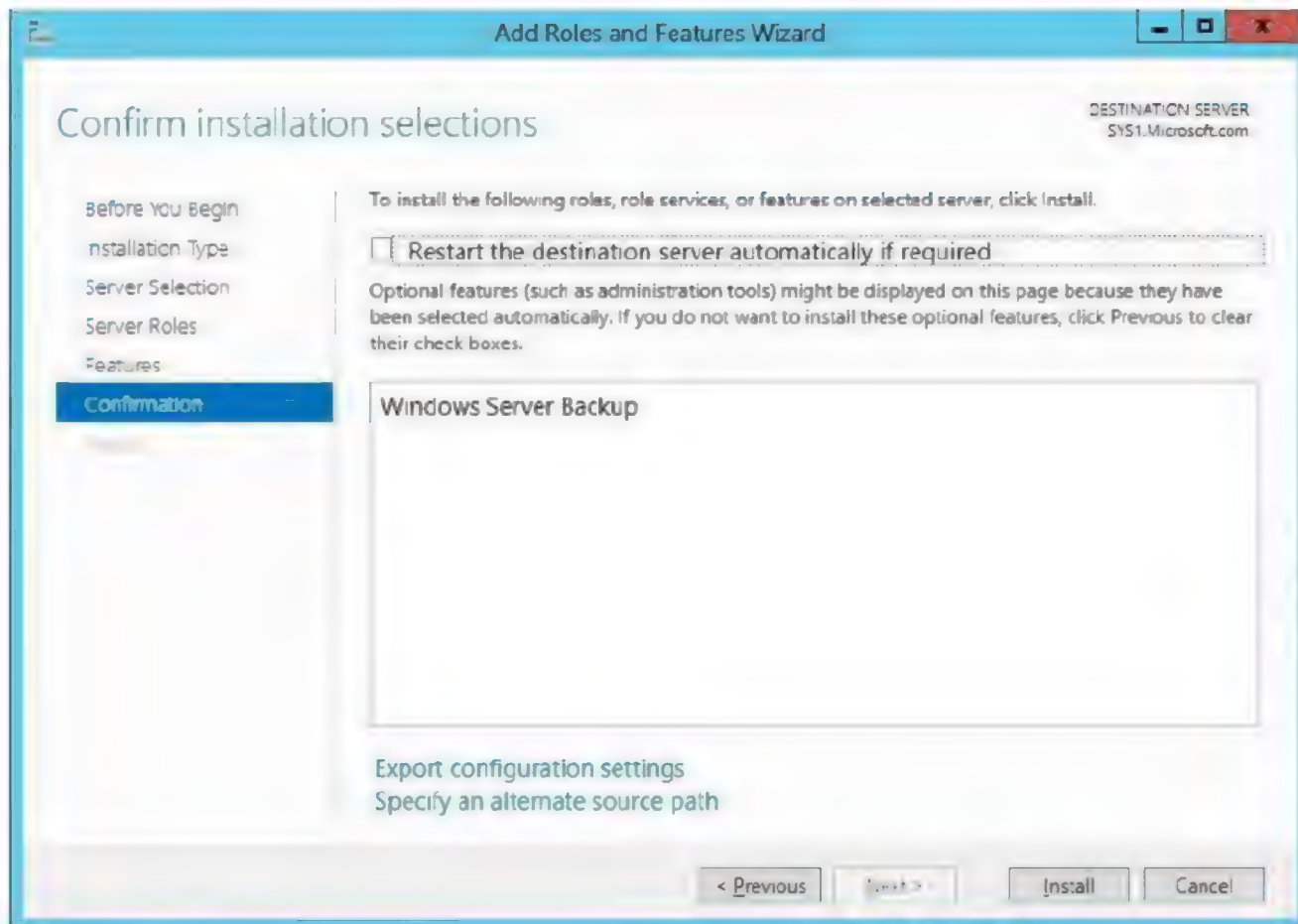
5. In Select server roles page, click **Next**.



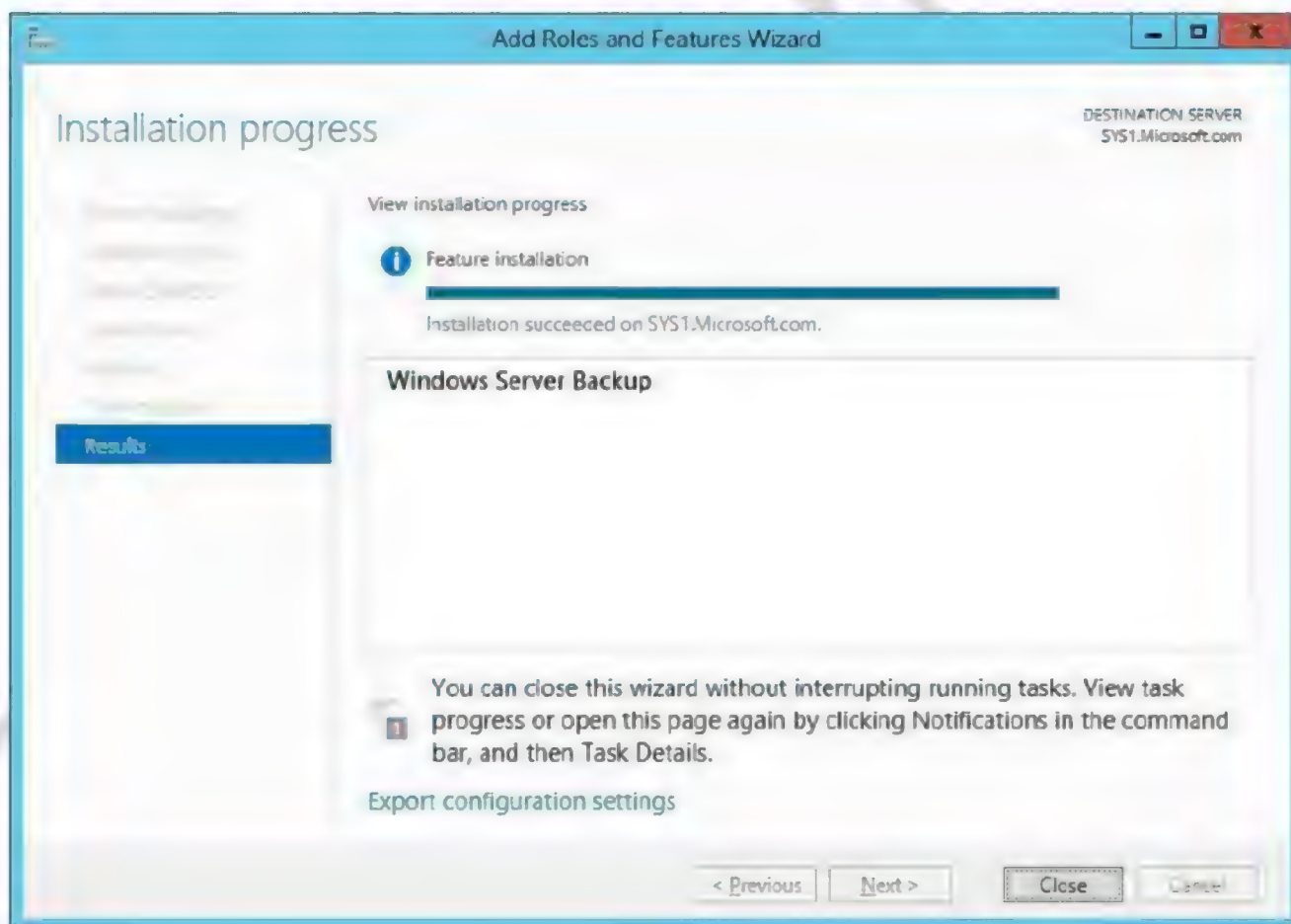
6. In Select features page, check the box **Windows Server Backup** and click **Next**.



7. Check box **Restart the destination server automatically if required**, click **Install**.

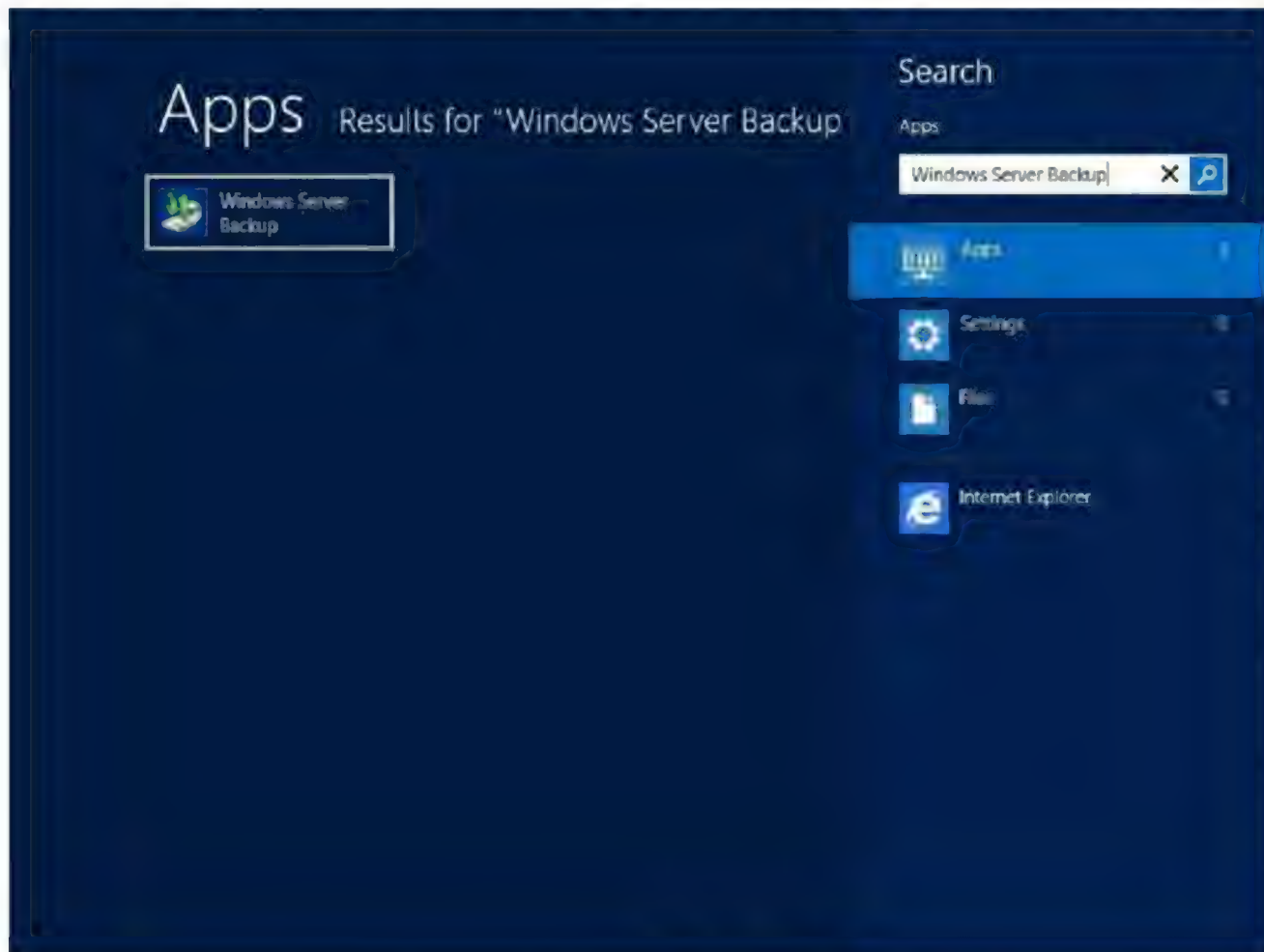


8. Click **Close** to complete the feature installation.

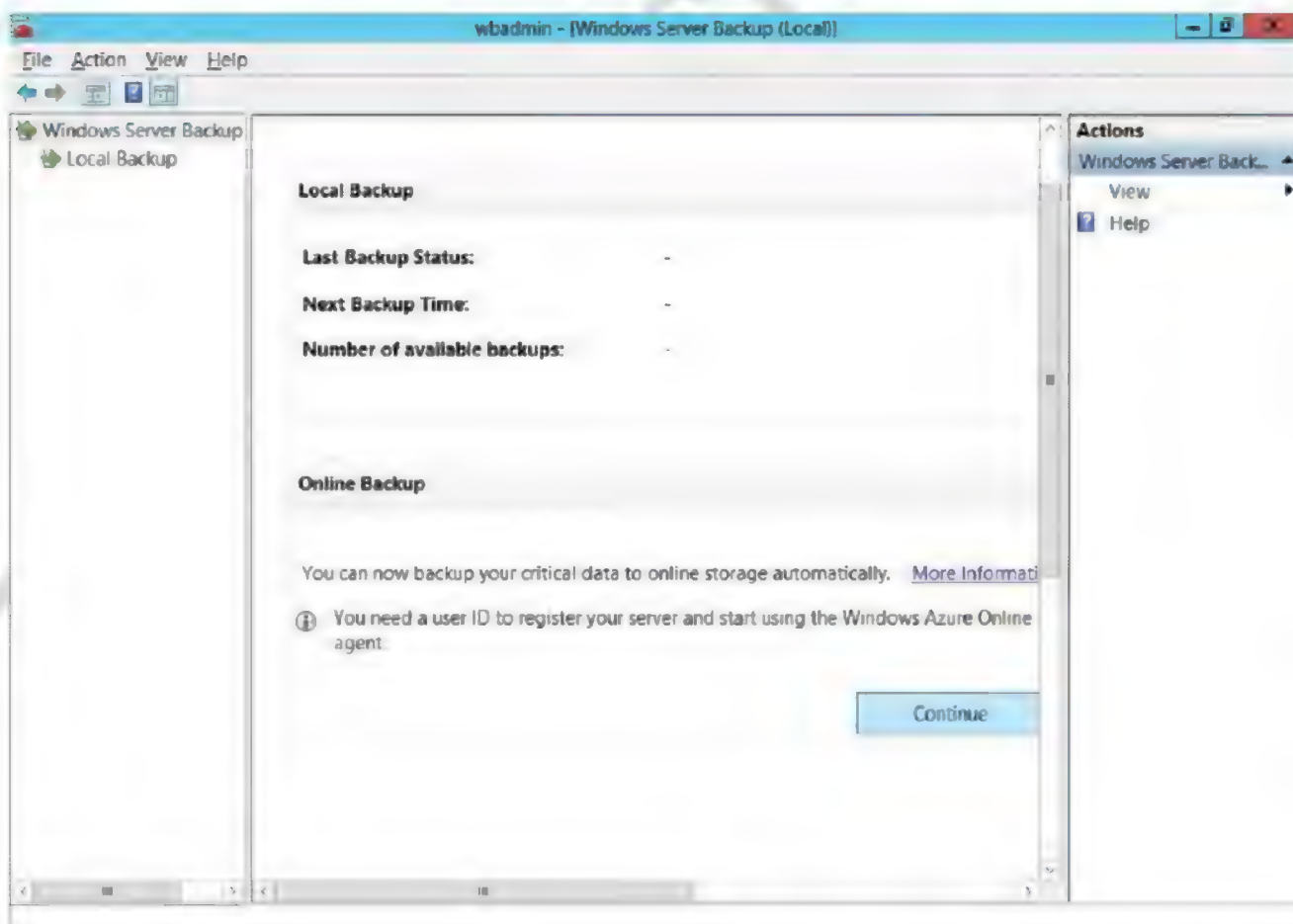


## How to Backup Data using Windows Server Backup

1. Go to Start, type Windows Server Backup in Search Apps, select **Windows Server Backup**.

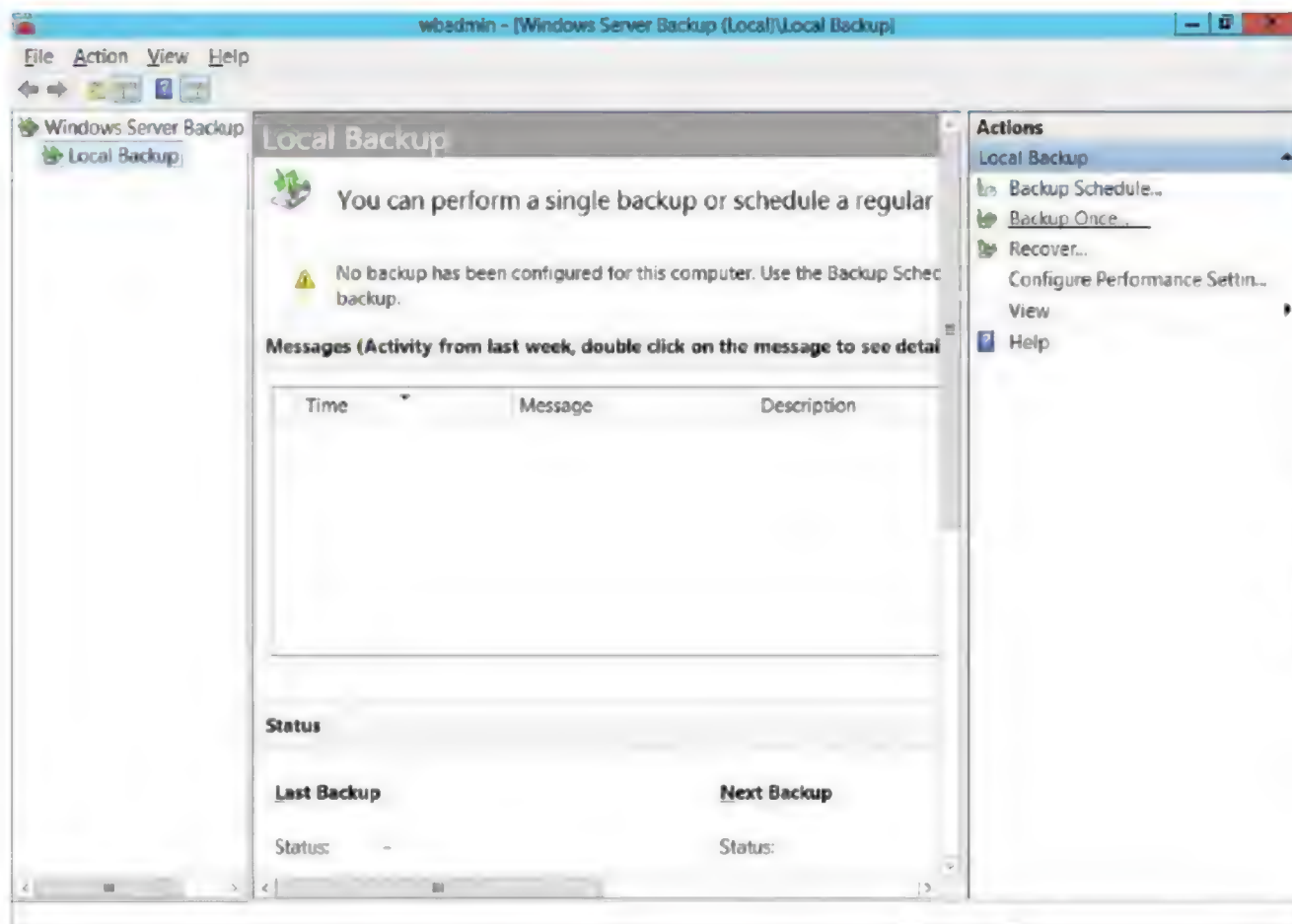


2. Select **Windows Server Backup**, (or) to use online backup click Continue under Online backup.

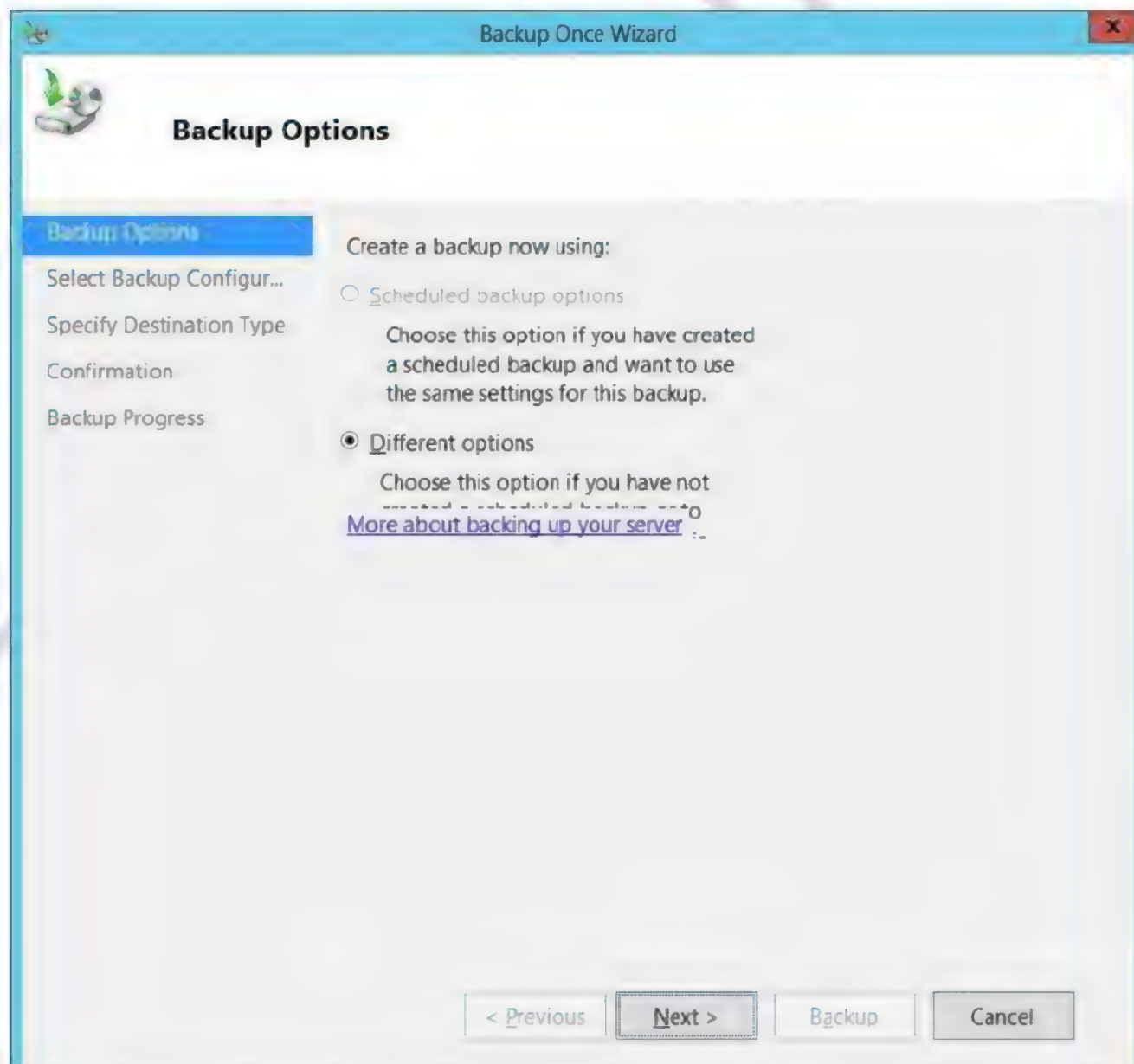




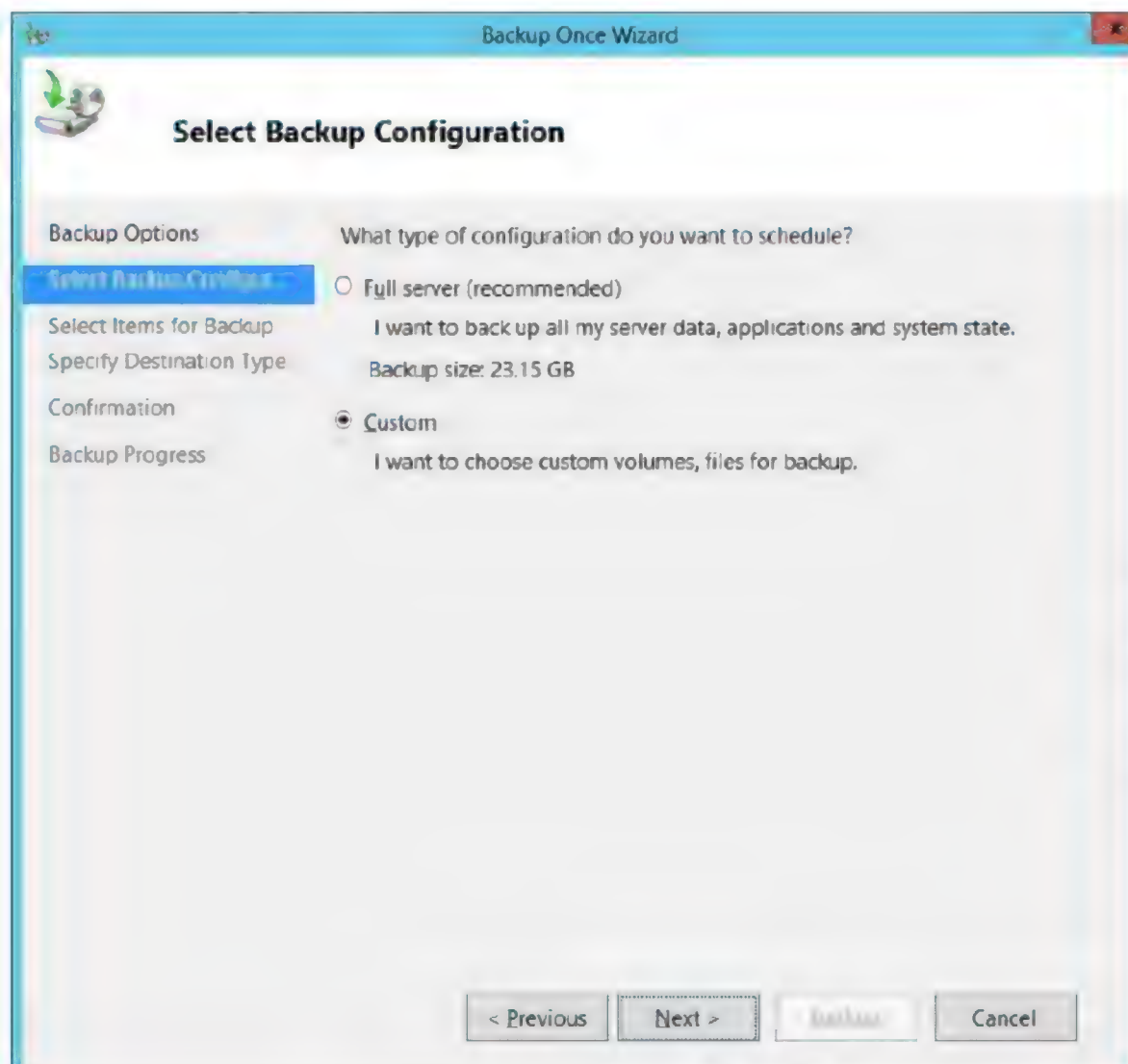
3. Select Local Backup, and click **Backup Once**.



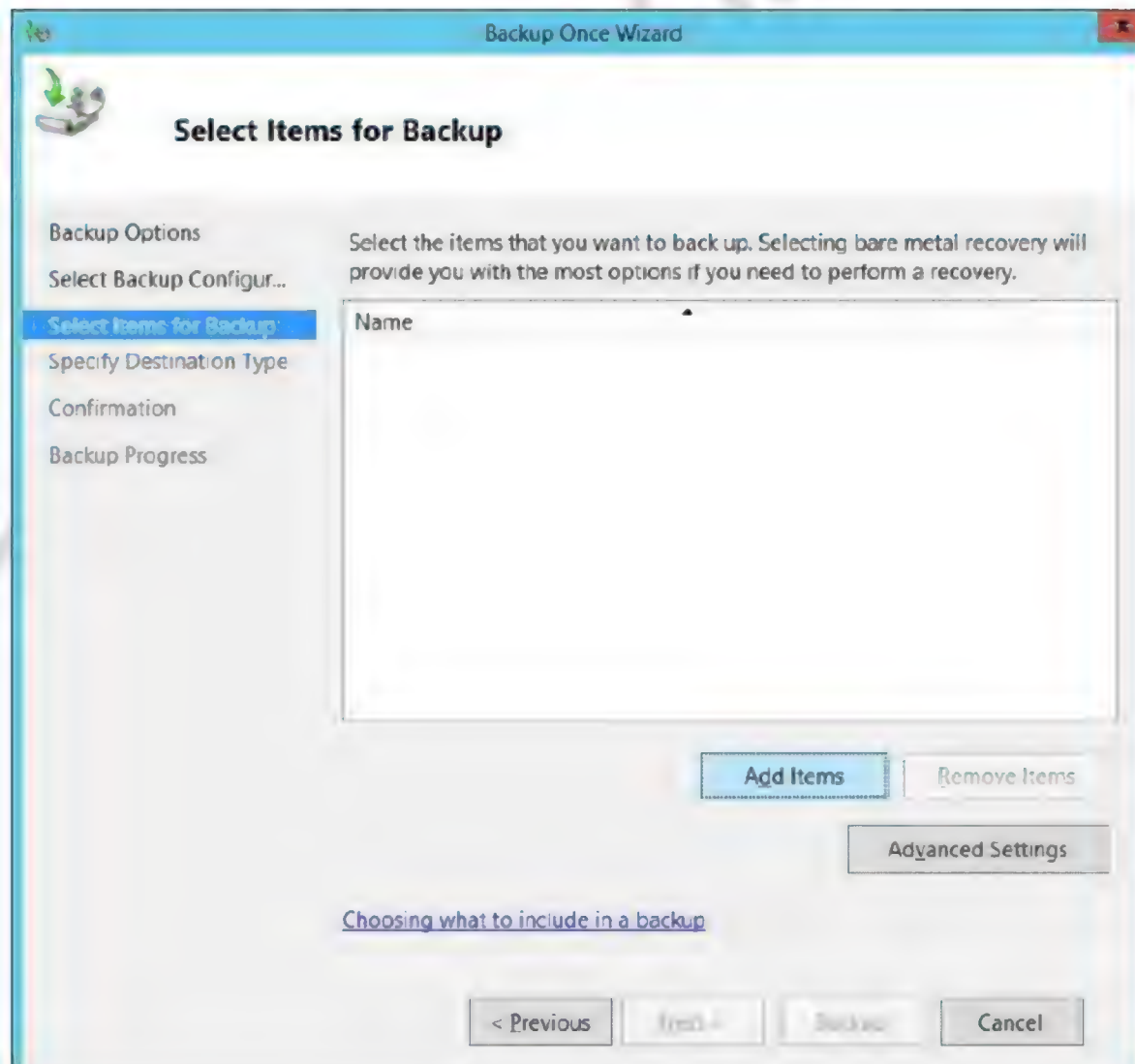
4. Select **Different Options**, click **Next**.



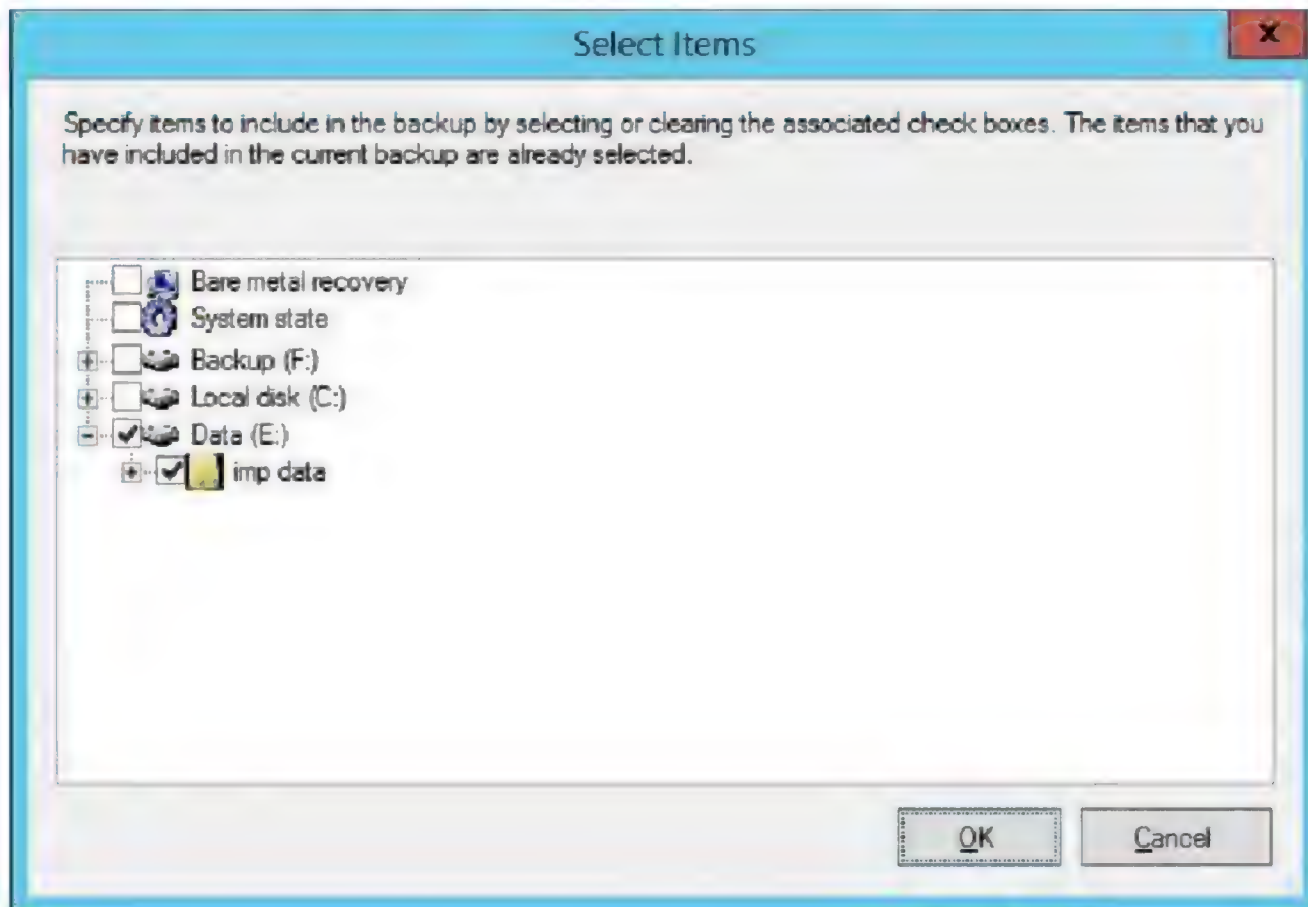
5. Select **Custom**, click **Next**.



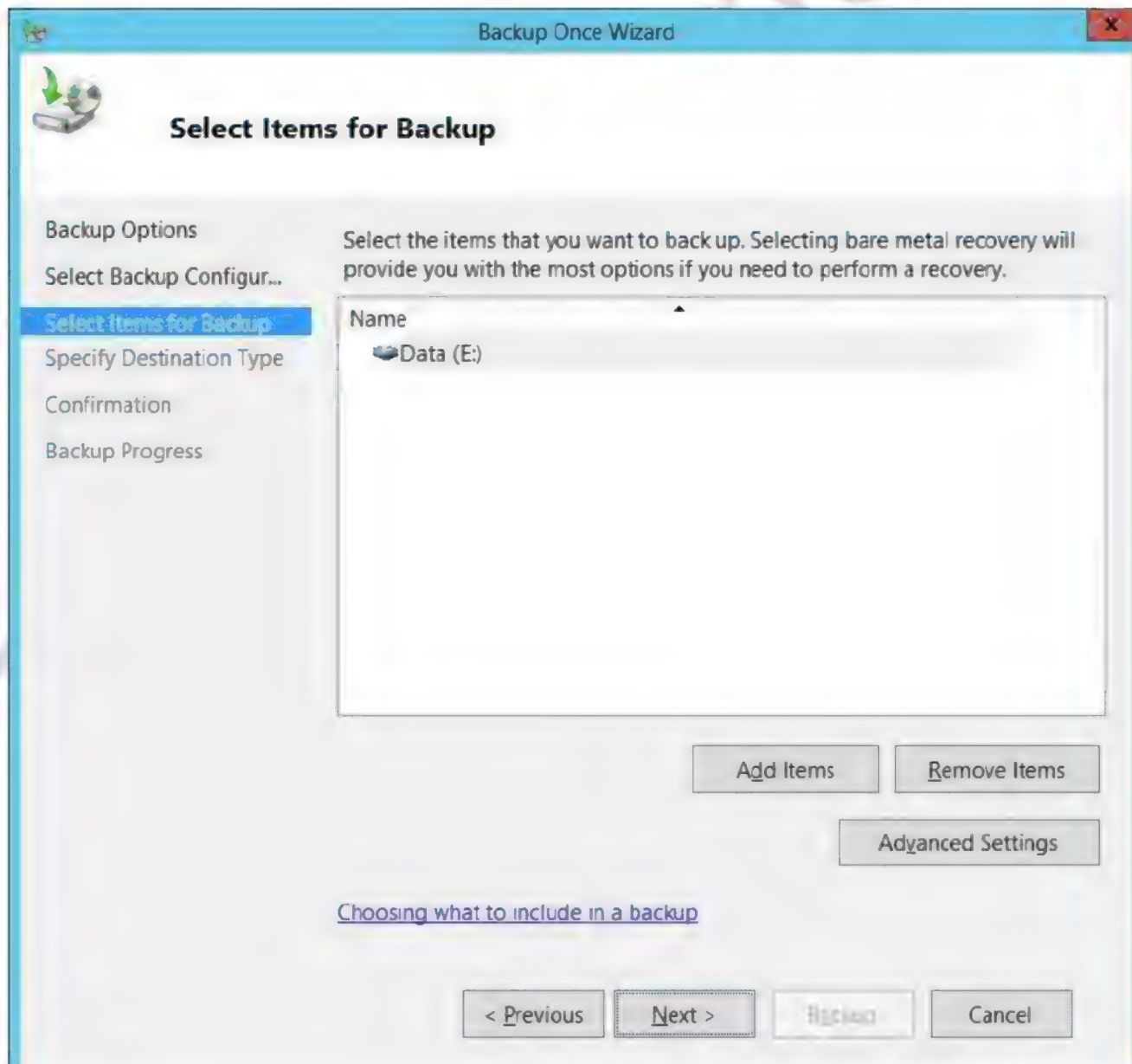
6. In Selects items for Backup, click **Add Items**.



7. In Select Items window, check the box **imp data folder**, click **OK**.

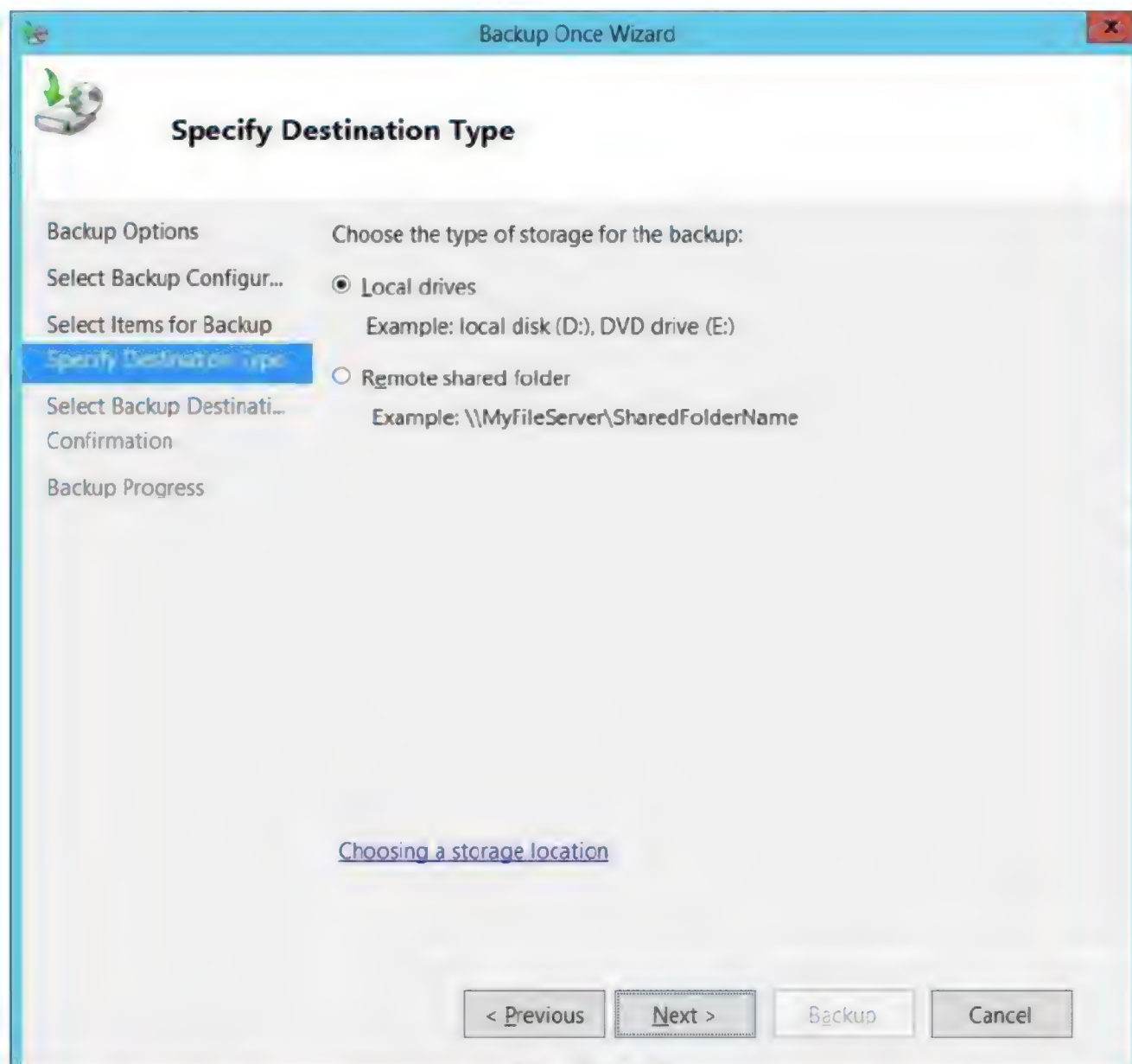


8. In Select Items for Backup page, click **Next**.

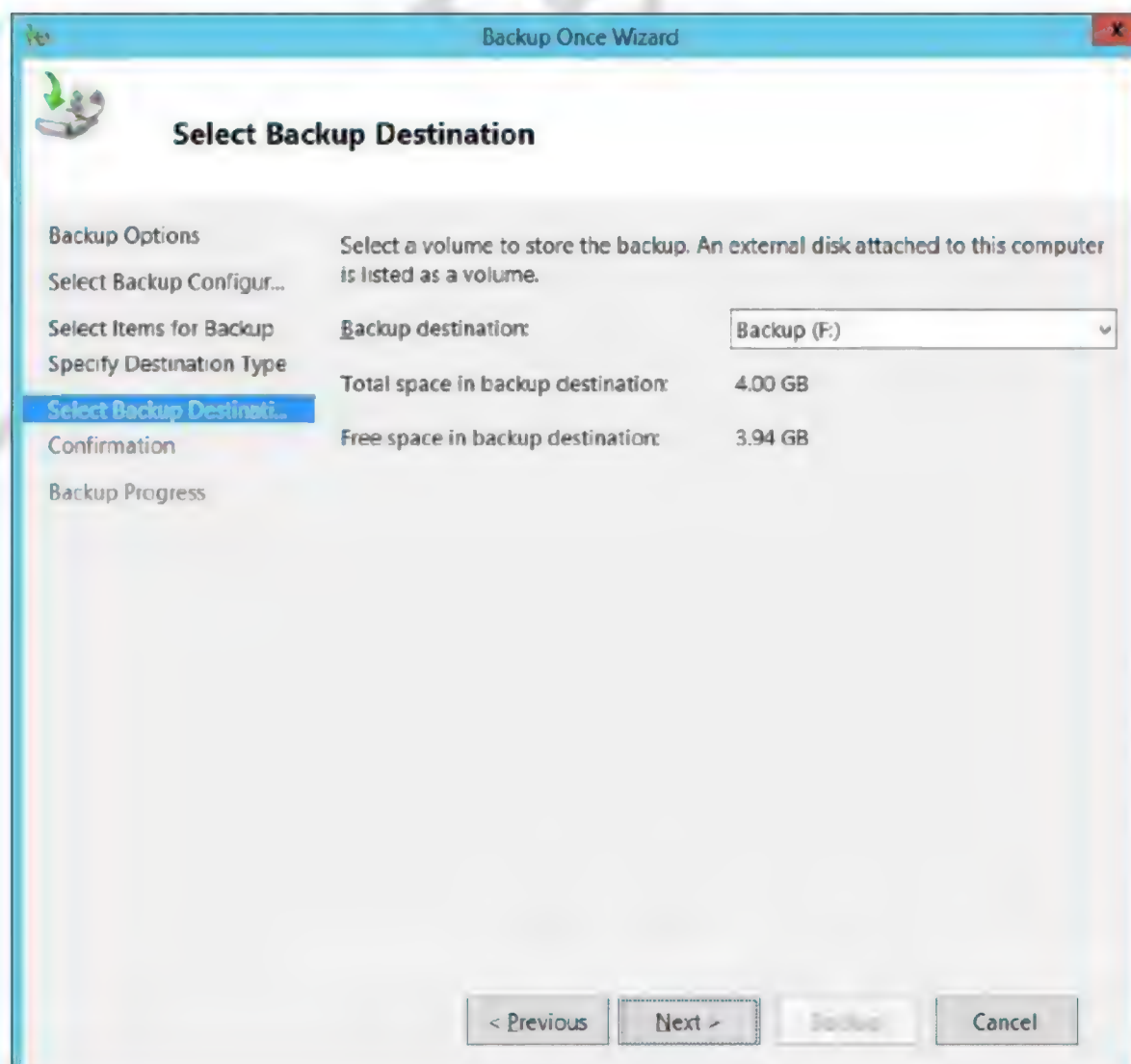




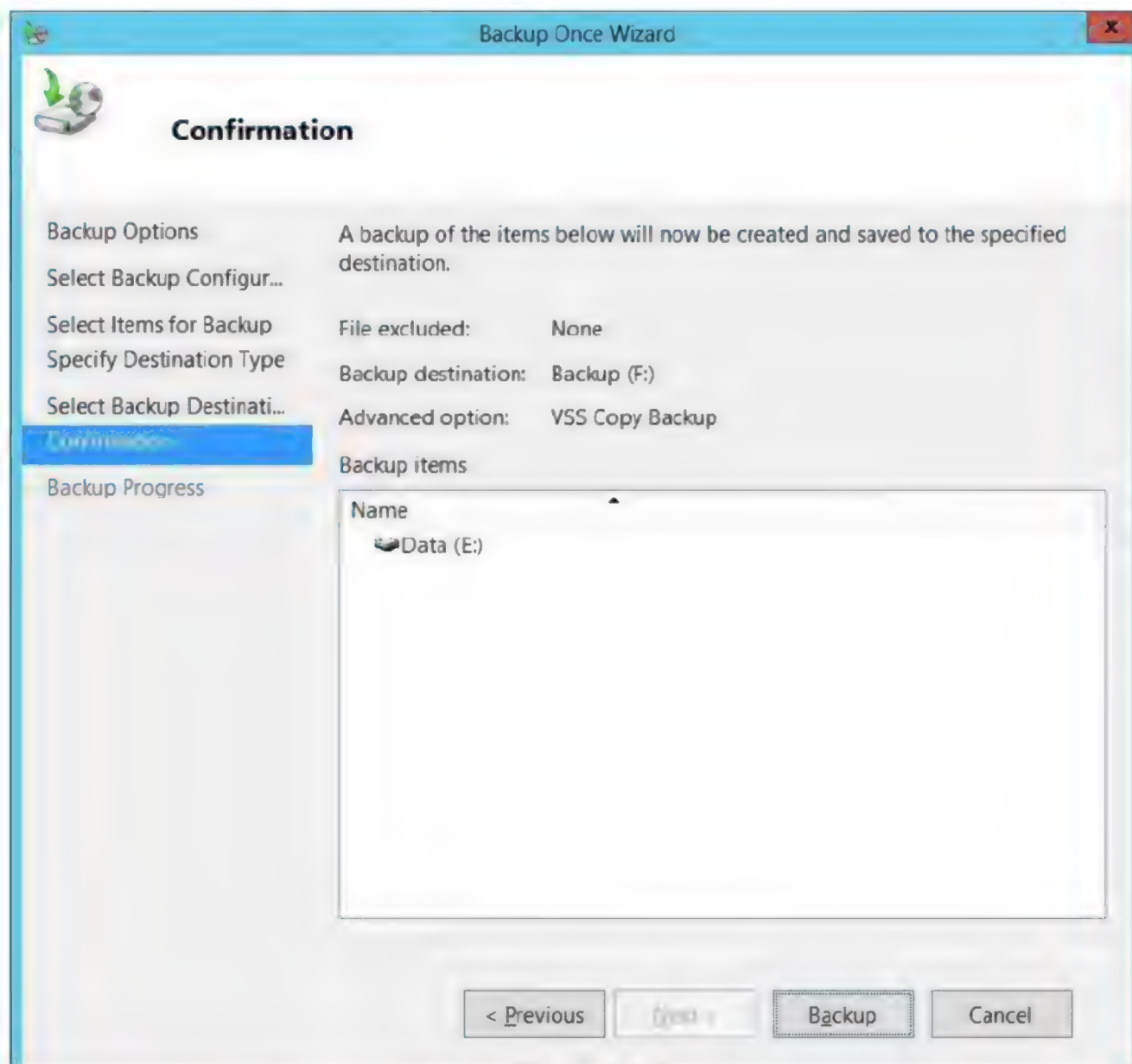
9. In Specify Destination Type page, select **Local drives**, click **Next**.



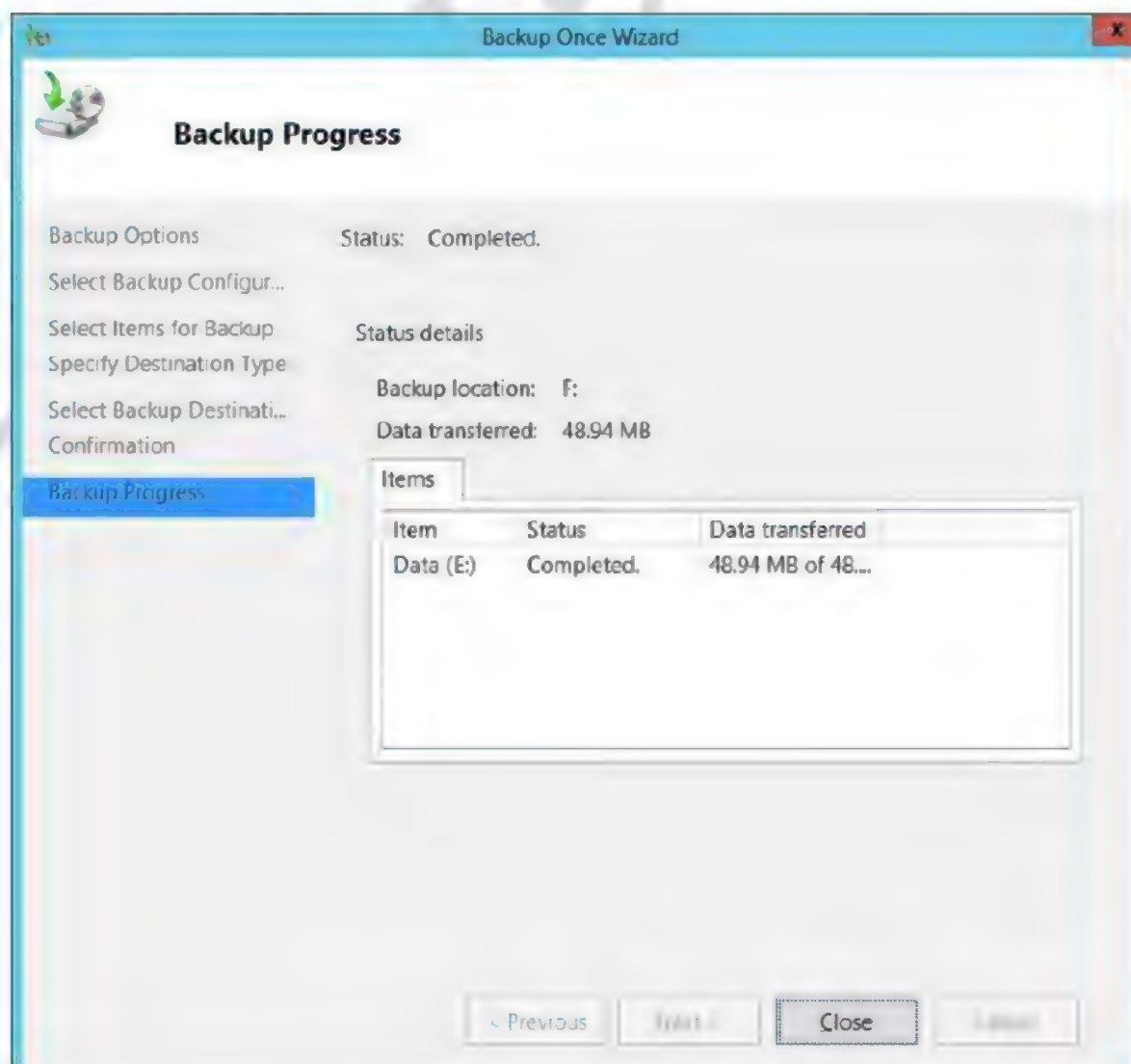
10. In Select Backup Destination, select Backup destination **Backup Drive**, click **Next**.



11. In Confirmation page, click **Backup**.

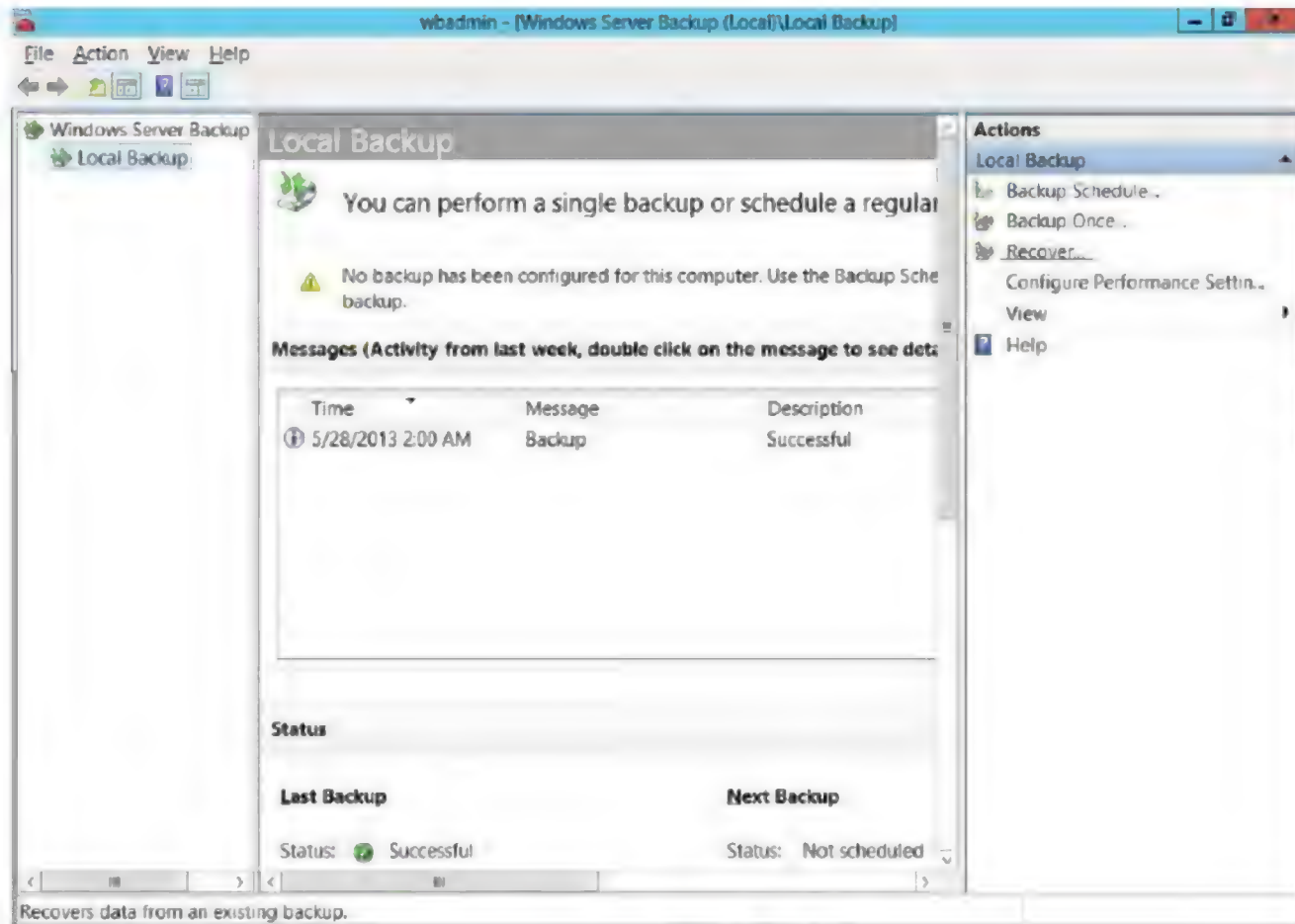


12. Finally click **Close**.

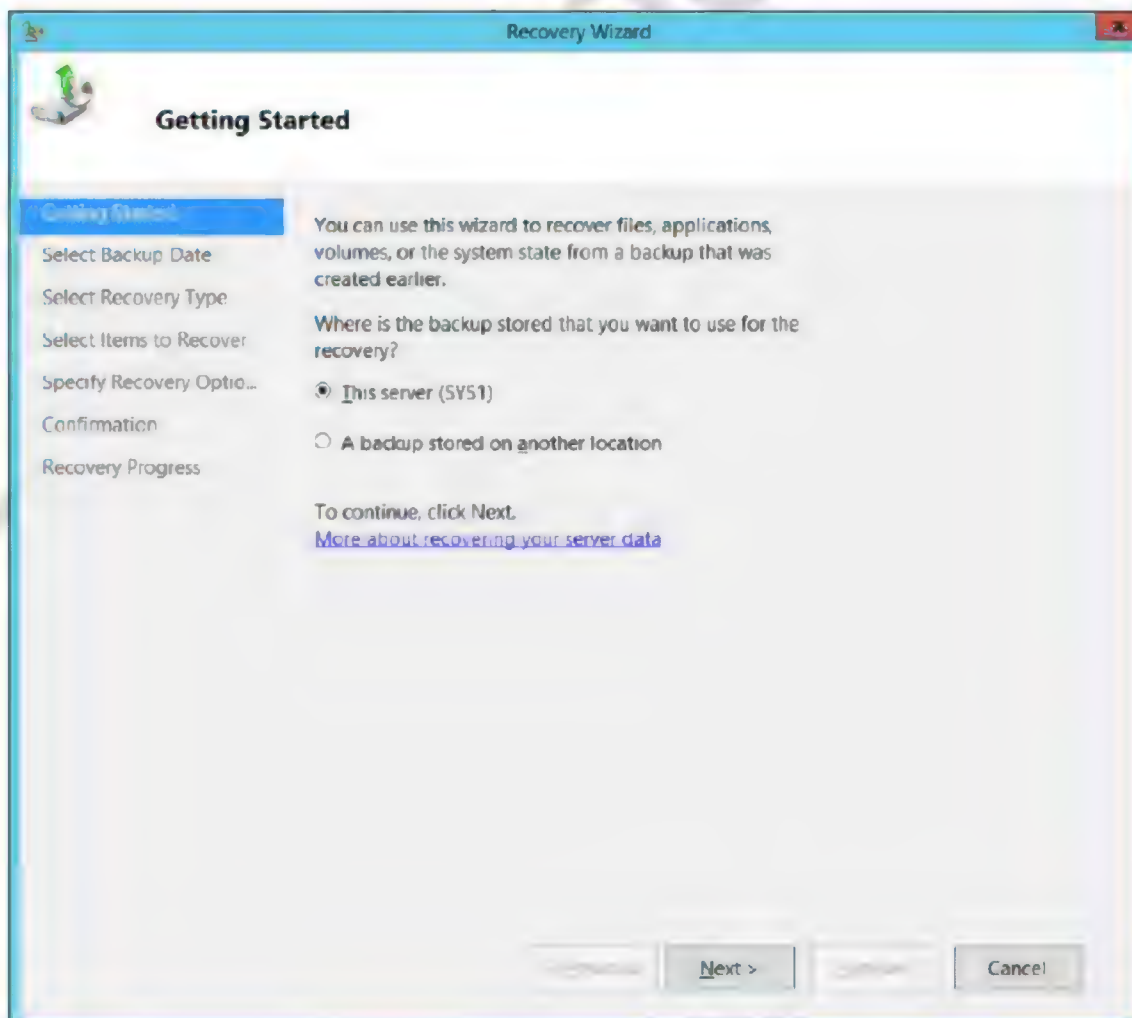


## How to Recover the Data from Backup File

1. Before Restoration, go to the drive and delete the data. (only for Lab purpose)
2. Go to Windows Server Backup, select Local Backup, and click **Recover**.



3. In Getting Started page, select **This server**, click **Next**





- Select Date and Time of the Backup file to be restored, click **Next**.

**Recovery Wizard**

**Select Backup Date**

Getting Started  
**Select Backup Date**  
 Select Recovery Type  
 Select Items to Recover  
 Specify Recovery Optio...  
 Confirmation  
 Recovery Progress

Oldest available backup: 5/28/2013 2:00 AM  
 Newest available backup: 5/28/2013 2:00 AM

**Available backups**  
 Select the date of a backup to use for recovery. Backups are available for dates shown in bold.

May 2013						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	<b>28</b>	29	30	31	

Backup date: 5/28/2013  
 Time: 2:00 AM  
 Location: Backup (F:)  
 Status: Available online  
 Recoverable items: [Data \(E:\)](#)

< Previous   Next >   Recover   Cancel

- In select Recovery Type, select **Files and folders**, click **Next**.

**Recovery Wizard**

**Select Recovery Type**

Getting Started  
 Select Backup Date  
**Select Recovery Type**  
 Select Items to Recover  
 Specify Recovery Optio...  
 Confirmation  
 Recovery Progress

What do you want to recover?

☒ **Files and folders**  
 You can browse volumes included in this backup and select files and folders.

☐ **Hyper-V**  
 You can restore virtual machines to their original location, another location or copy the virtual hard disk files of a virtual machine.

☐ **Volumes**  
 You can restore an entire volume, such as all data stored on C:.

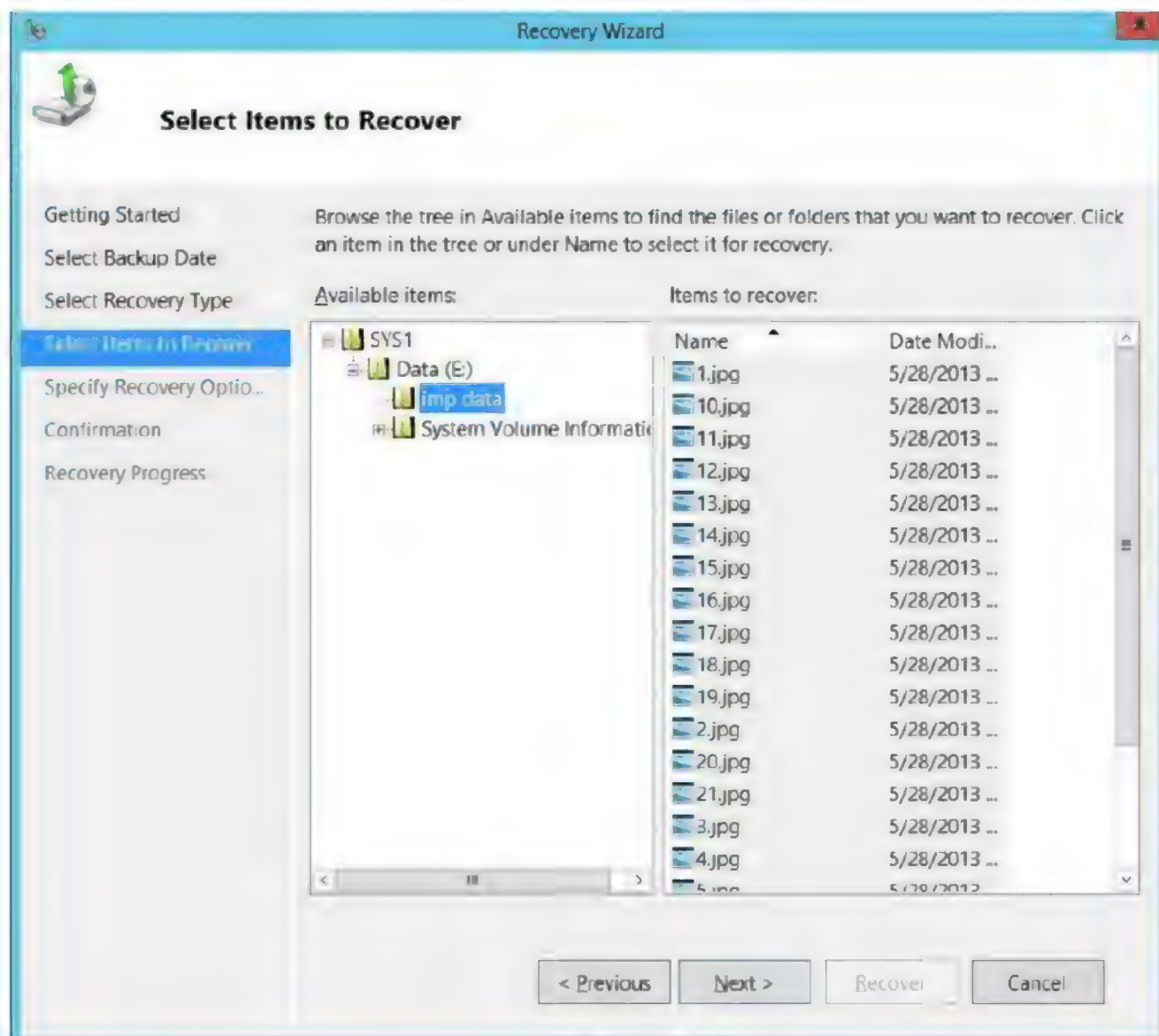
☐ **Applications**  
 You can recover applications that have registered with Windows Server Backup.

☐ **System state**  
 You can restore just the system state.

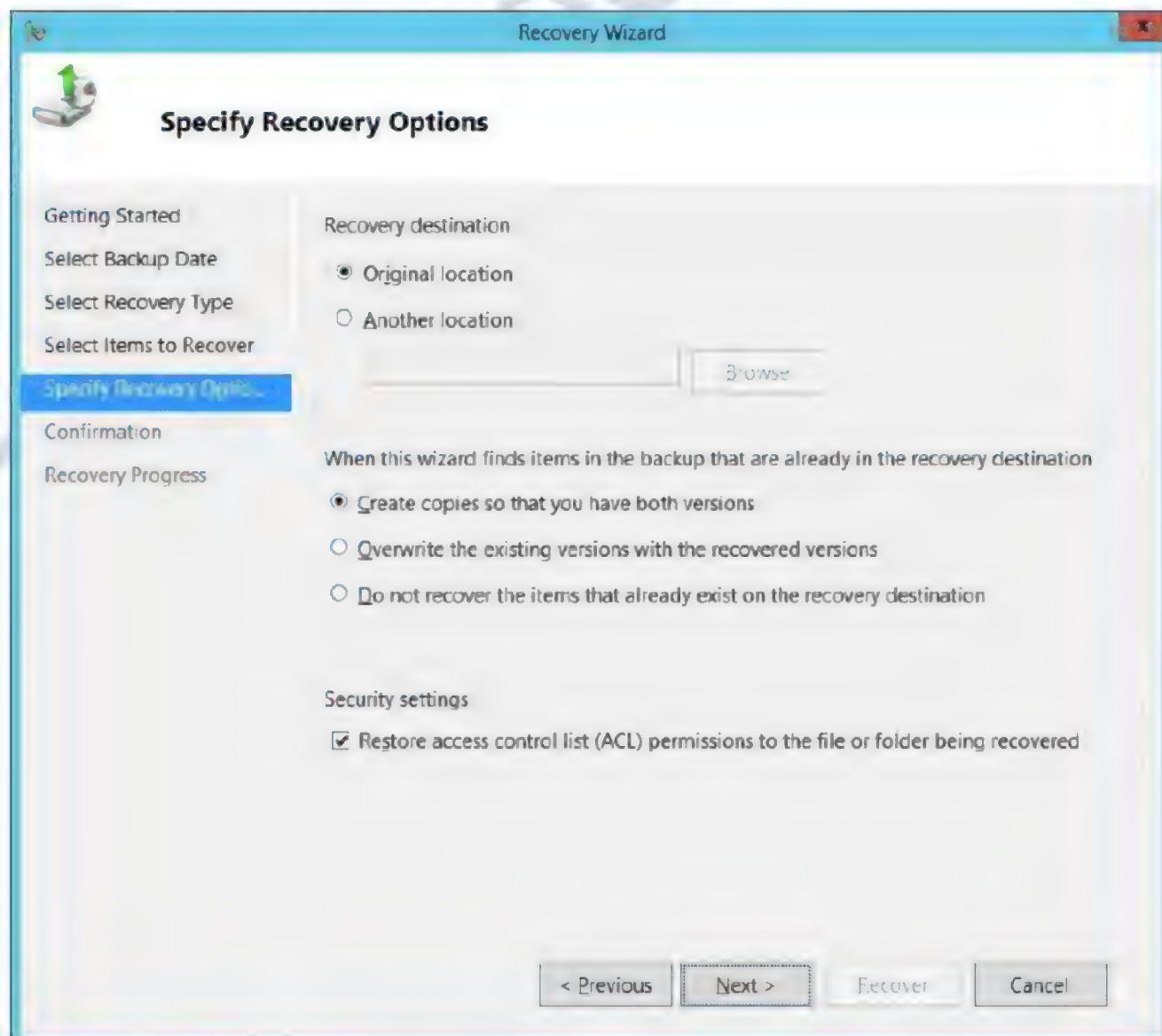
[More about performing recoveries](#)

< Previous   Next >   Recover   Cancel

6. Select the folder or files to be recovered and click **Next**.

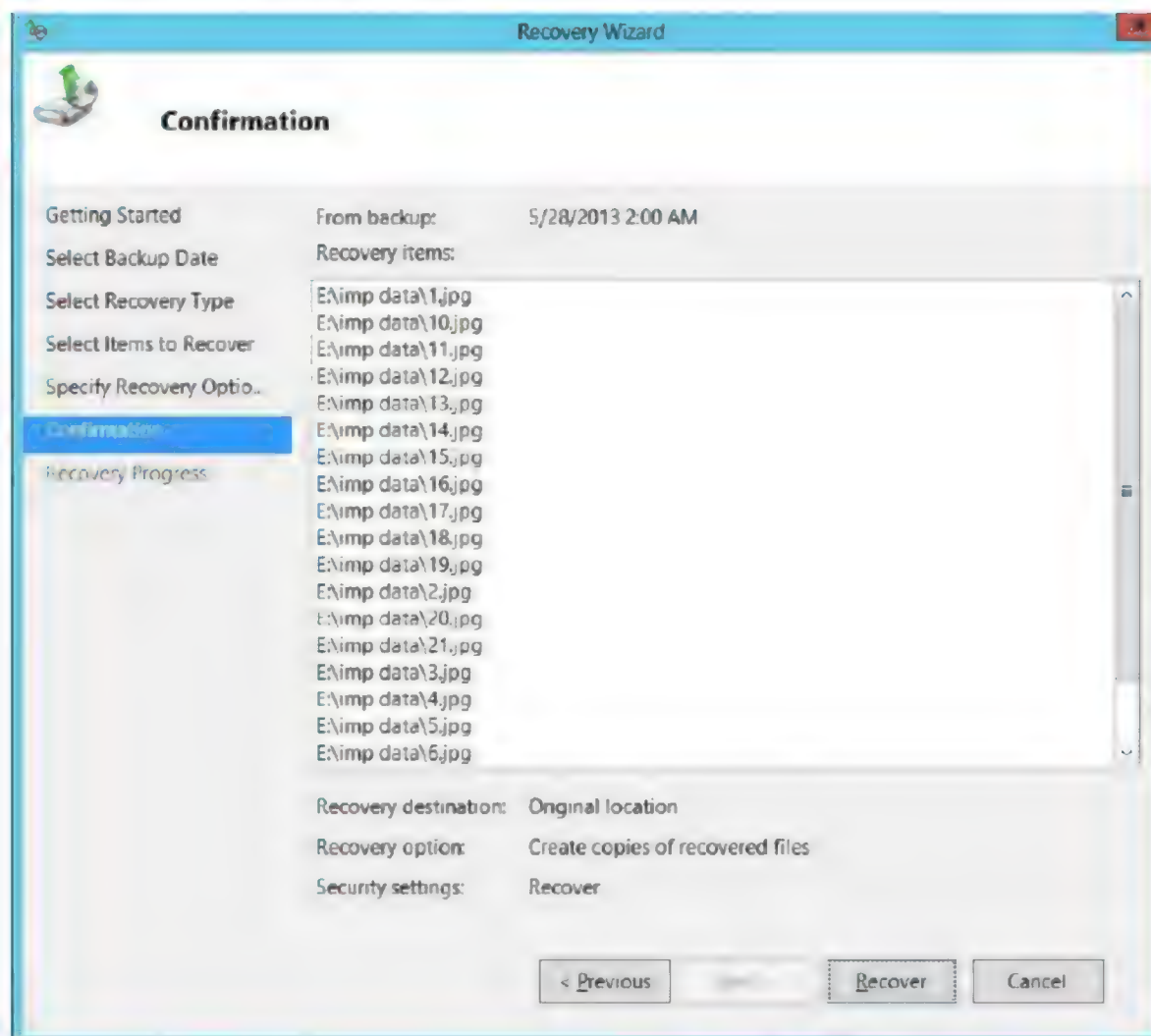


7. Select **Original location**, click **Next**.

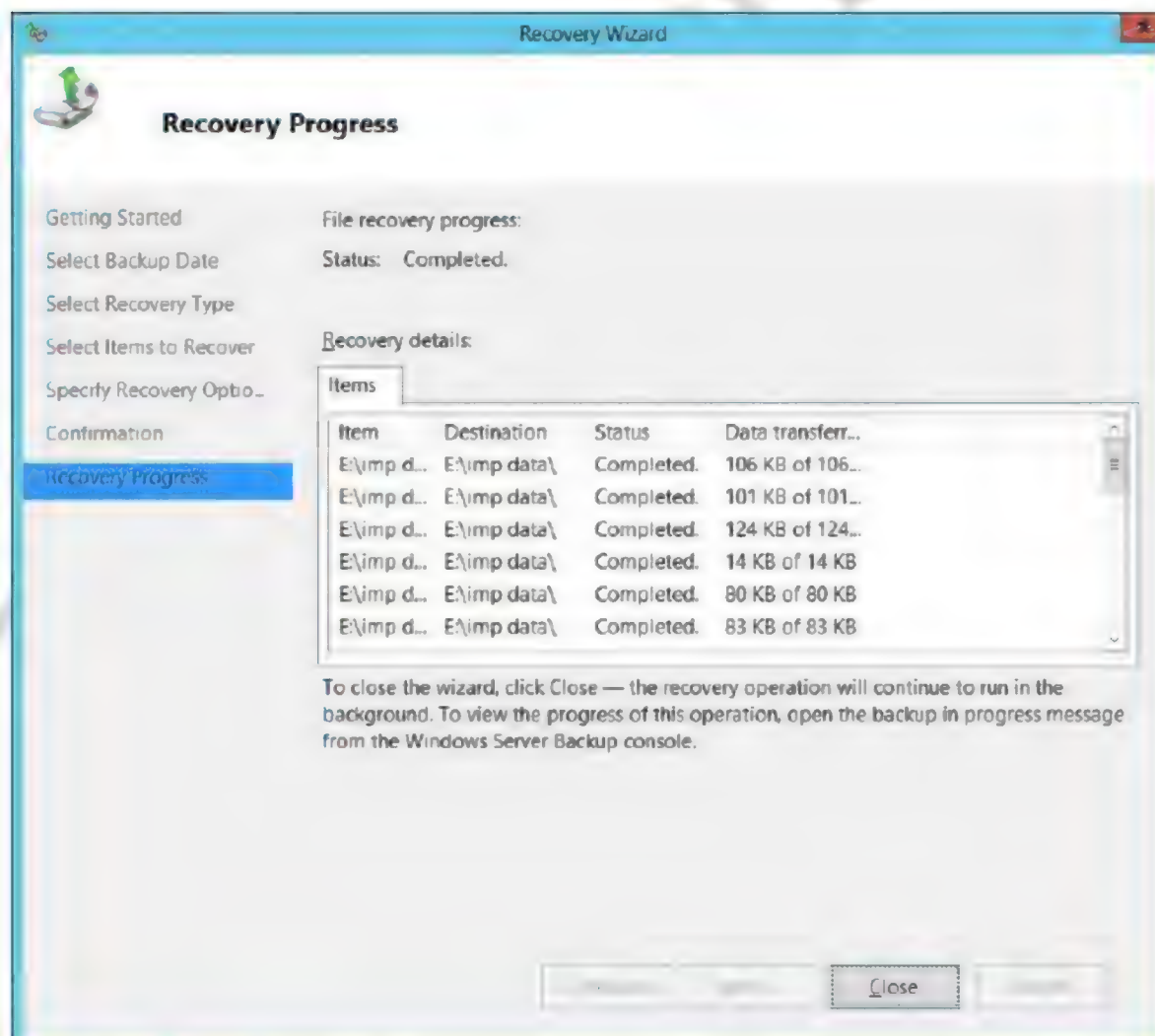




8. In Confirmation page, click **Recover**.



9. Click **Close**.



**Verification:** Go to the **drive** and verify for the **folder** and **files**.



## Lab – 83: Configuring Network Load Balancing

### Objective:

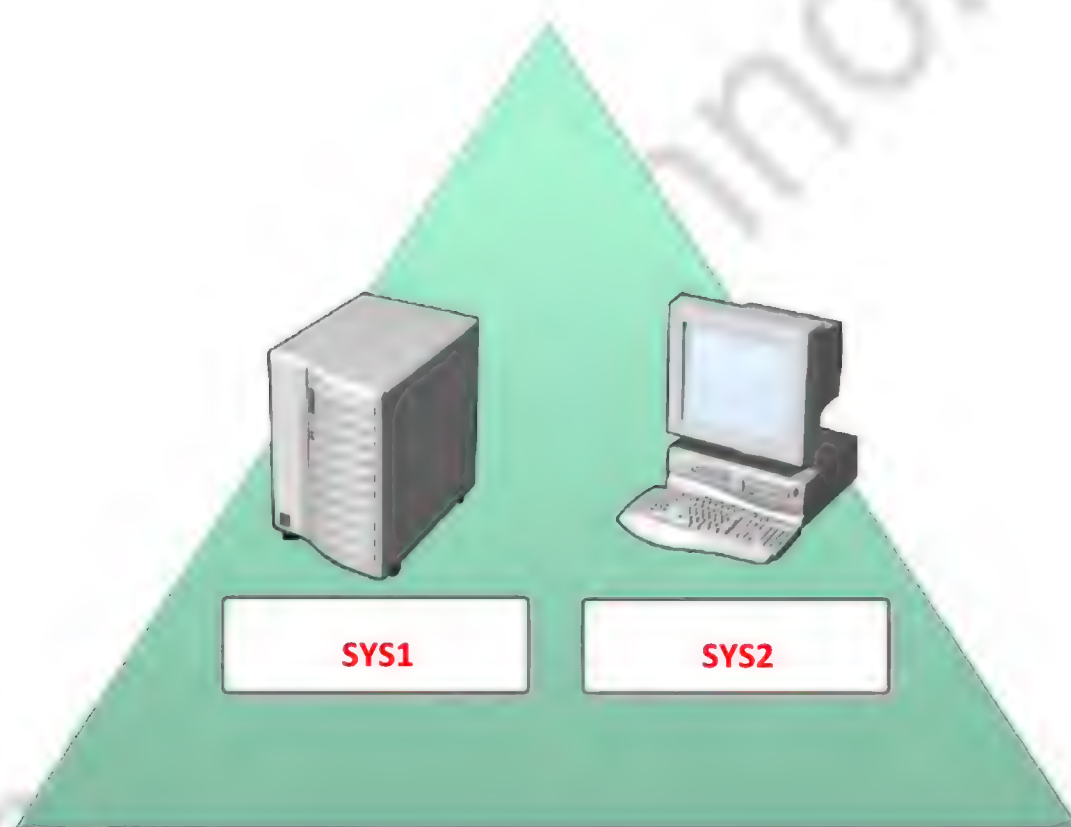
To Balance the Load between Web Servers using Network Load Balancer

### Prerequisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server or Member Server.

### Topology:



**MICROSOFT.COM**

#### **SYS1 (Web Server)**

#### **Domain Controller**

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

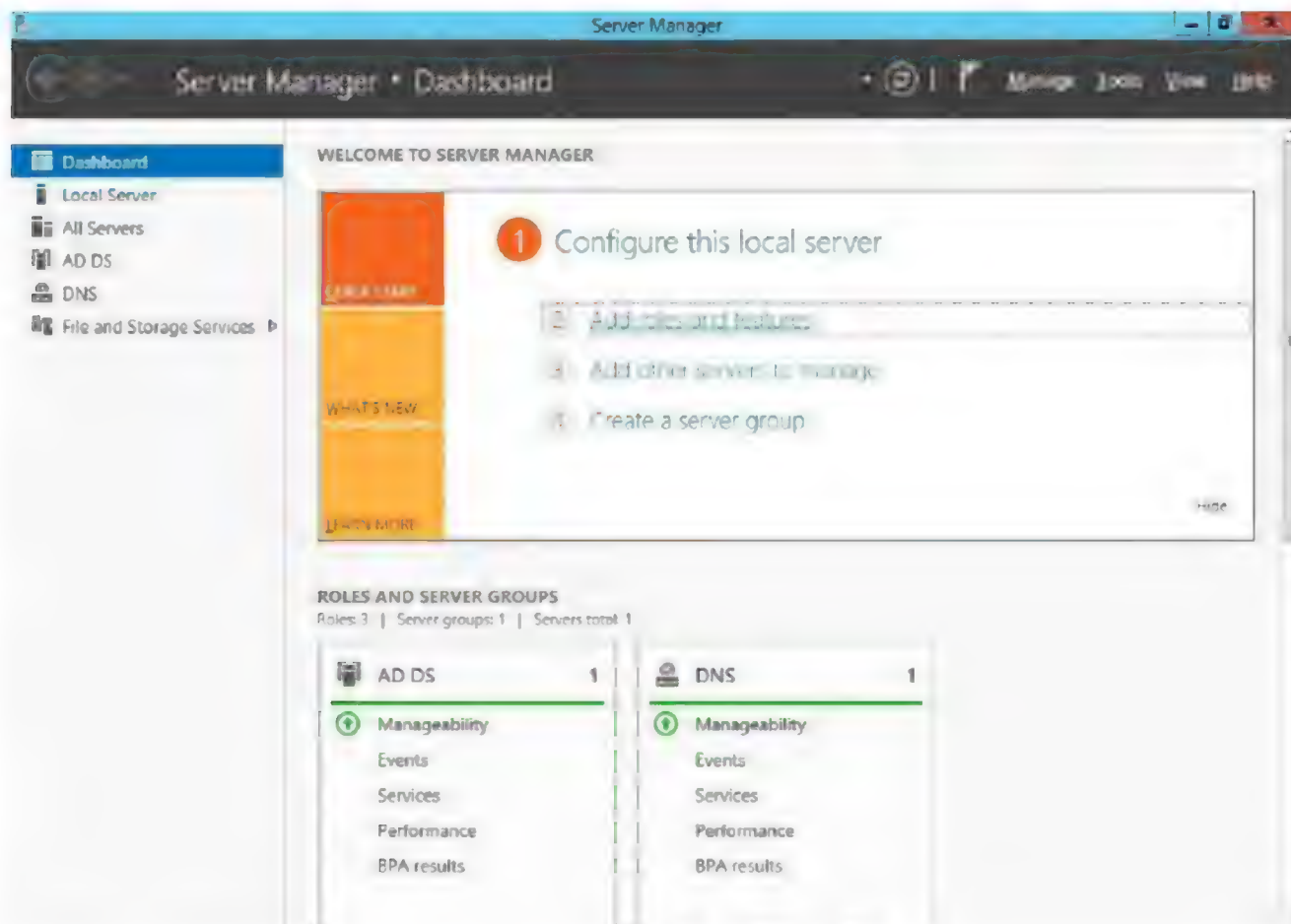
#### **SYS2 (Web Server)**

#### **Member Server**

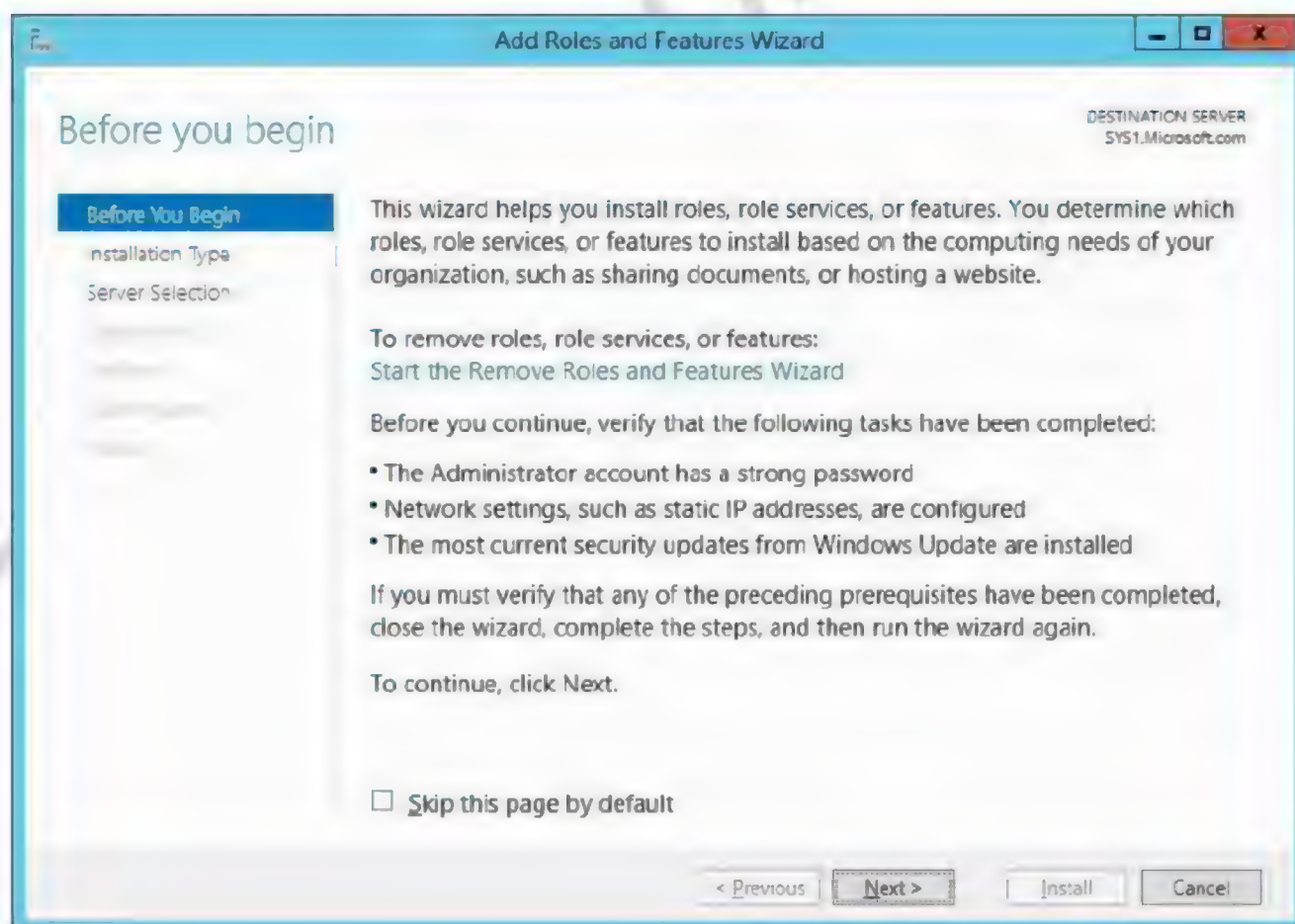
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

## SYS1 and SYS2 Configuration

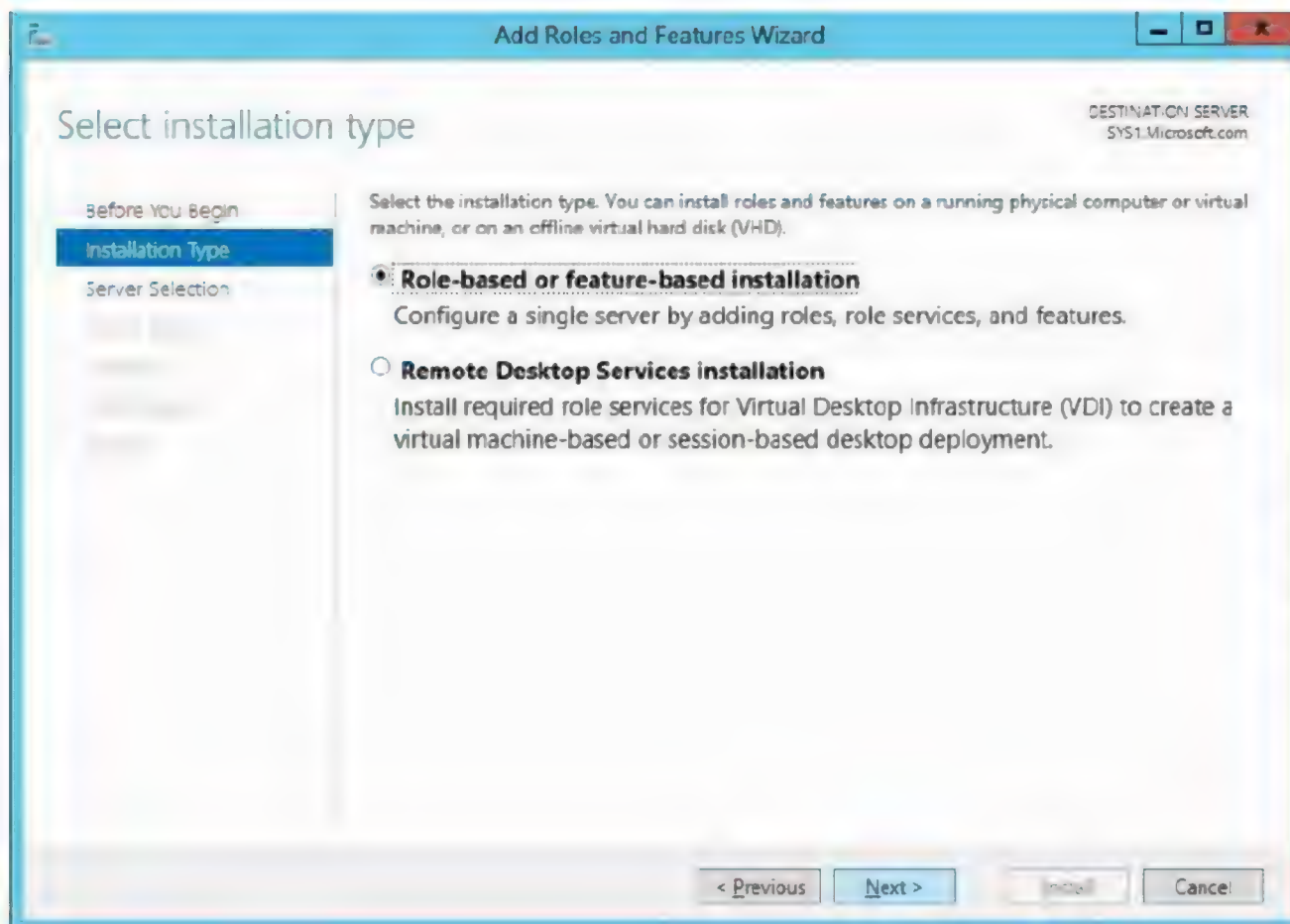
1. Login as **Administrator**, go to Server Manager Dashboard and click **Add roles and features**.



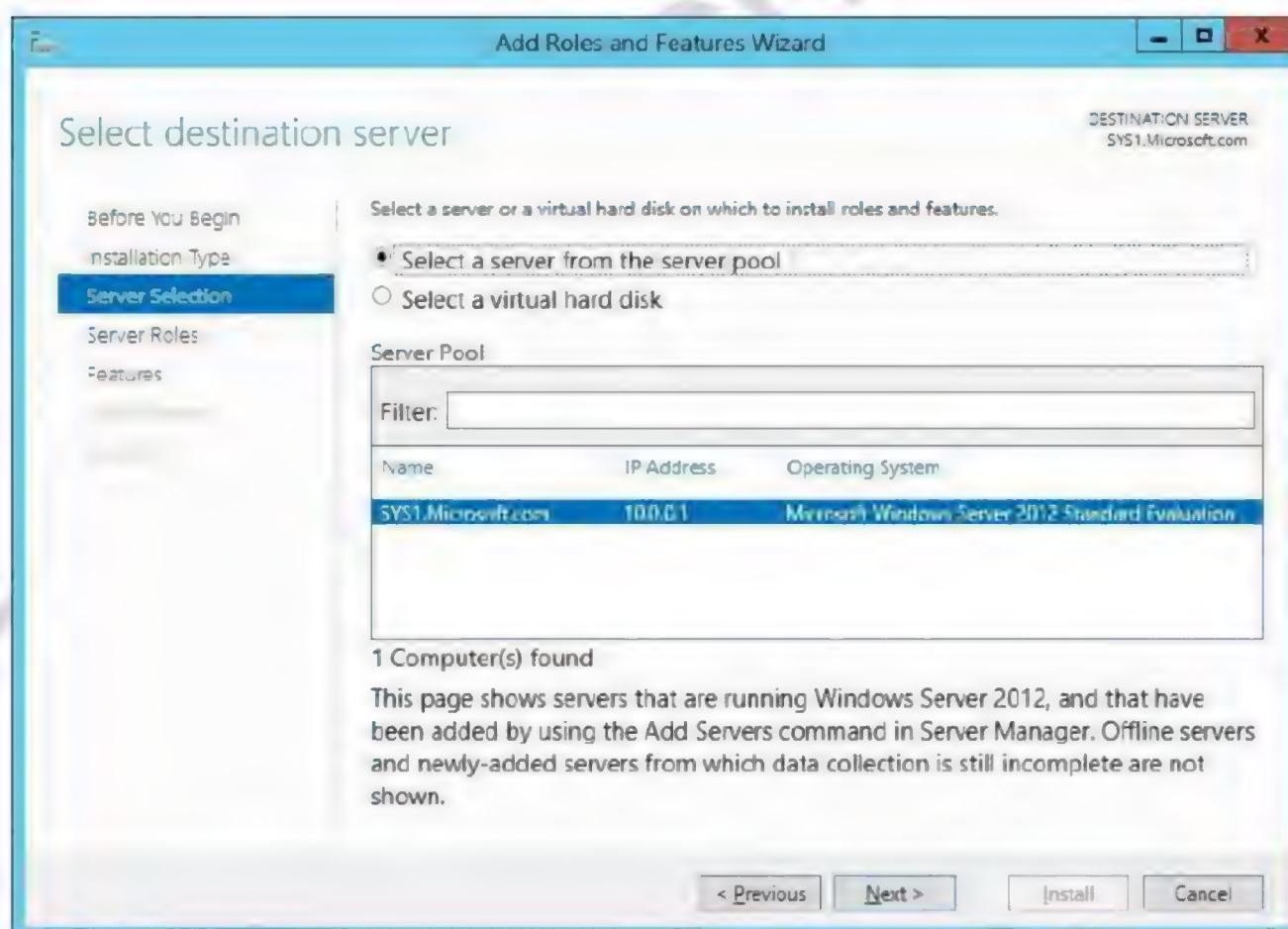
2. In Before you begin page, click **Next**.



3. Select **Role-based or feature-based installation**, click **Next**.

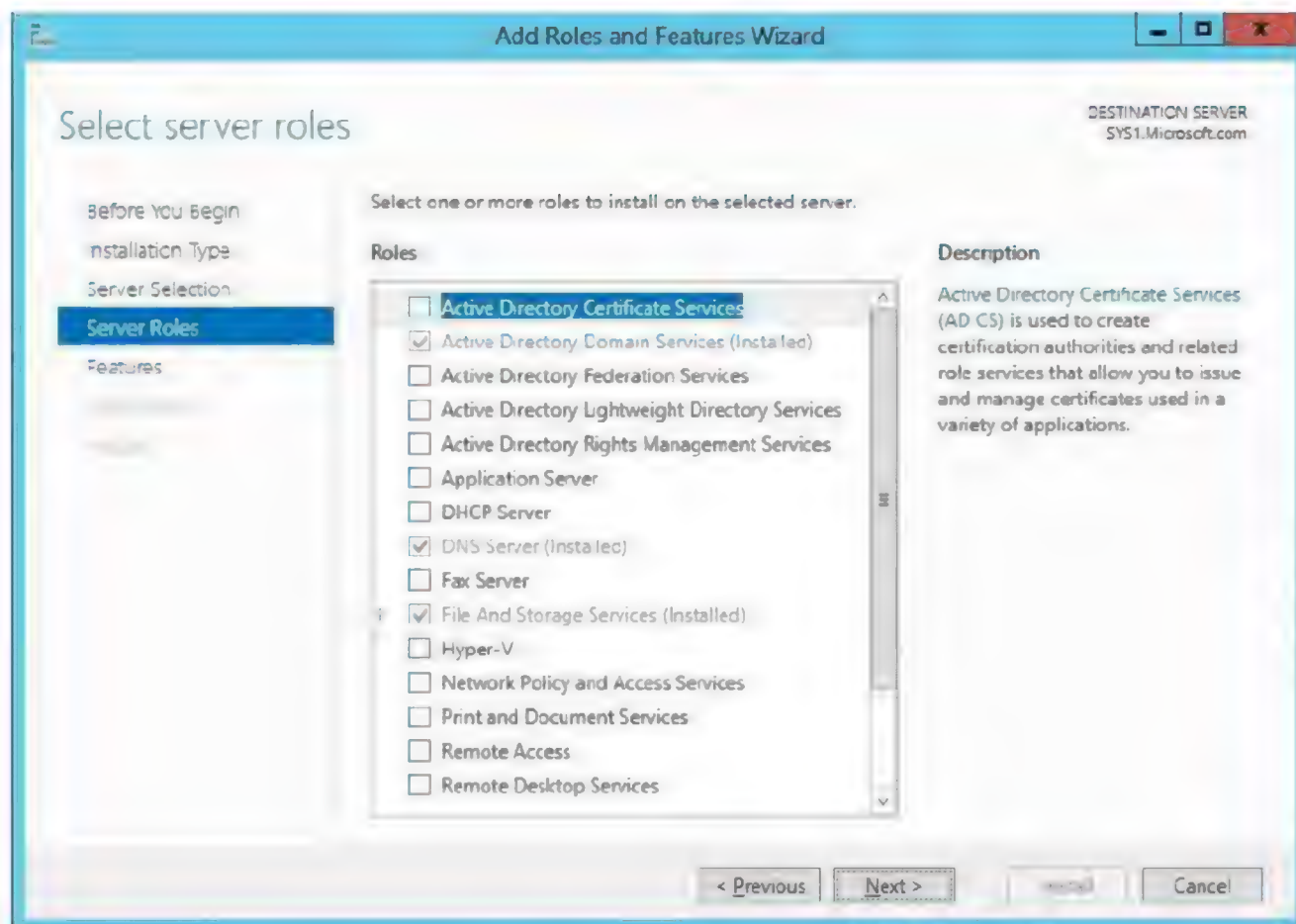


4. In Select destination server page, select a server (**SYS1.Microsoft.com**) from the server pool and click **Next**.

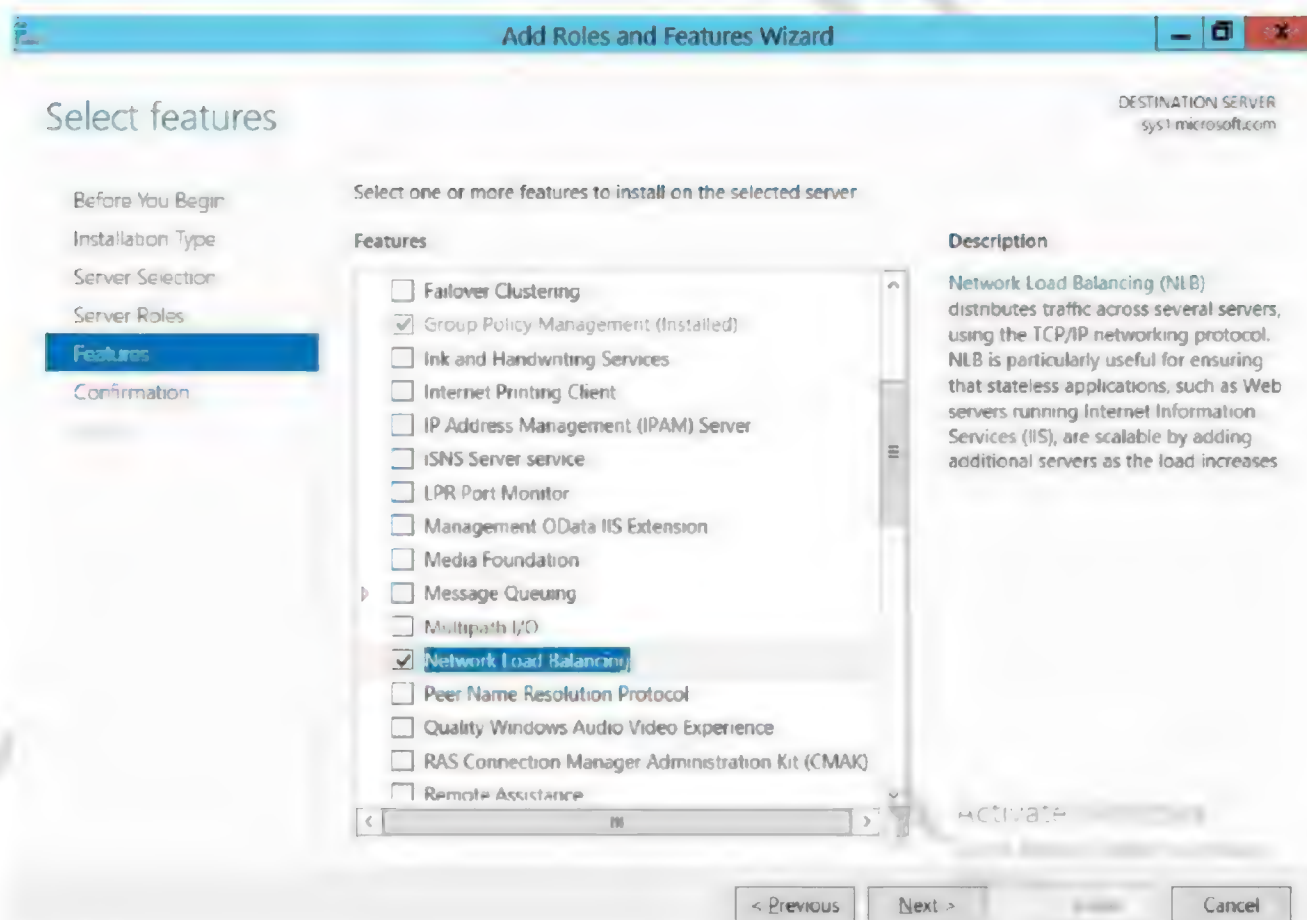




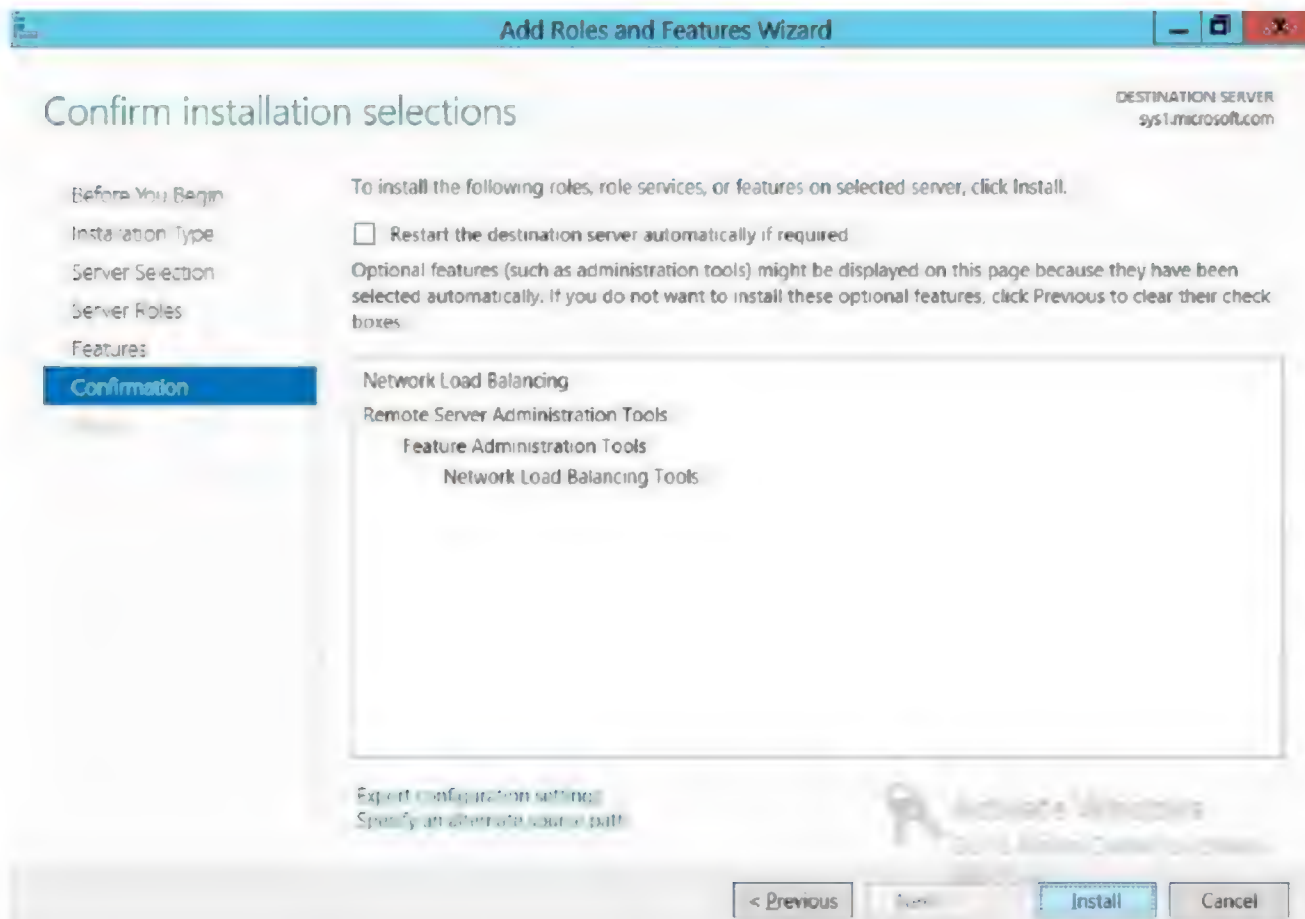
5. In Select server roles page, click **Next**.



6. In Select features page, check the box **Network Load Balancing** and click **Next**.



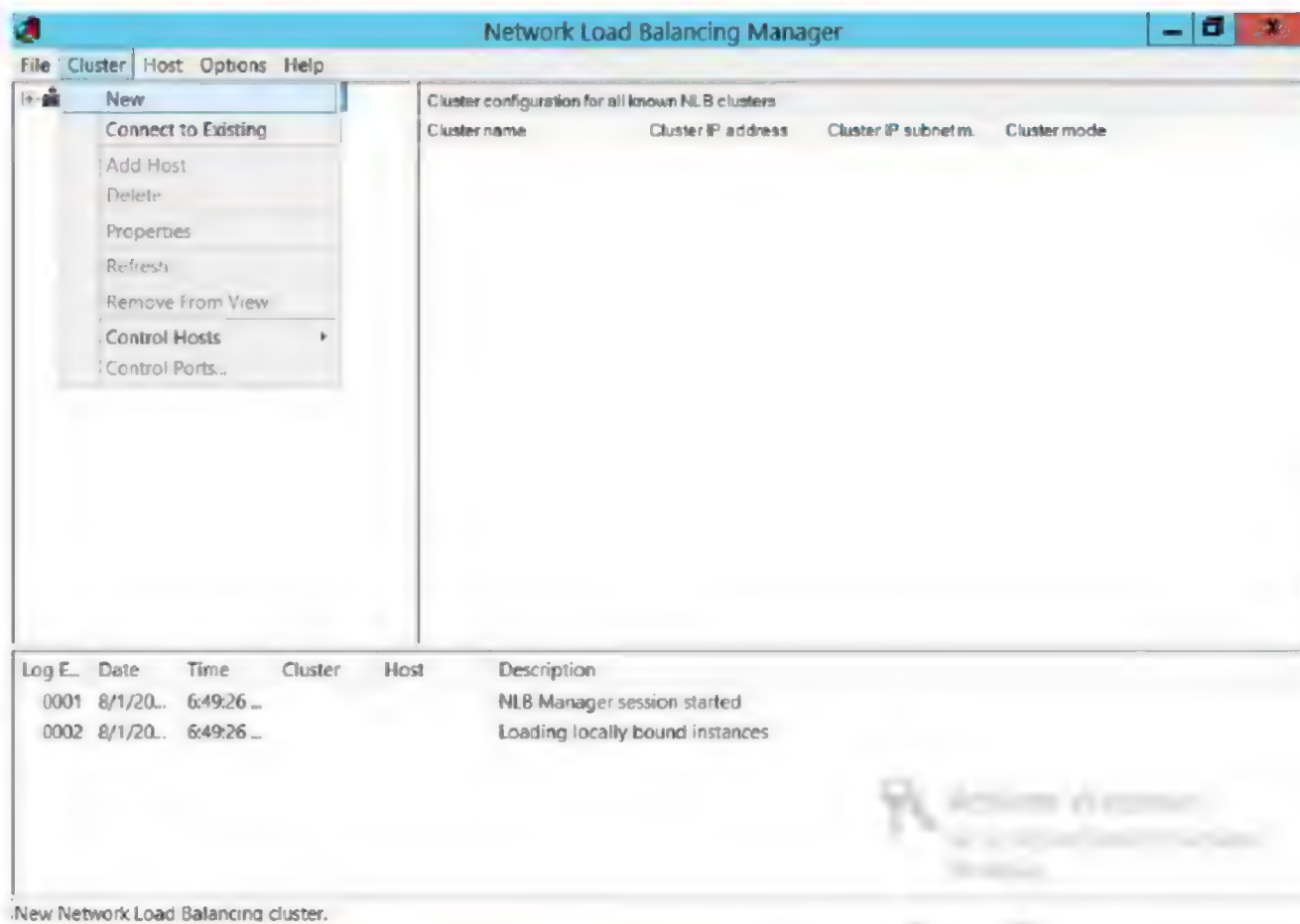
7. Check box **Restart the destination server automatically if required**, click **Install**.



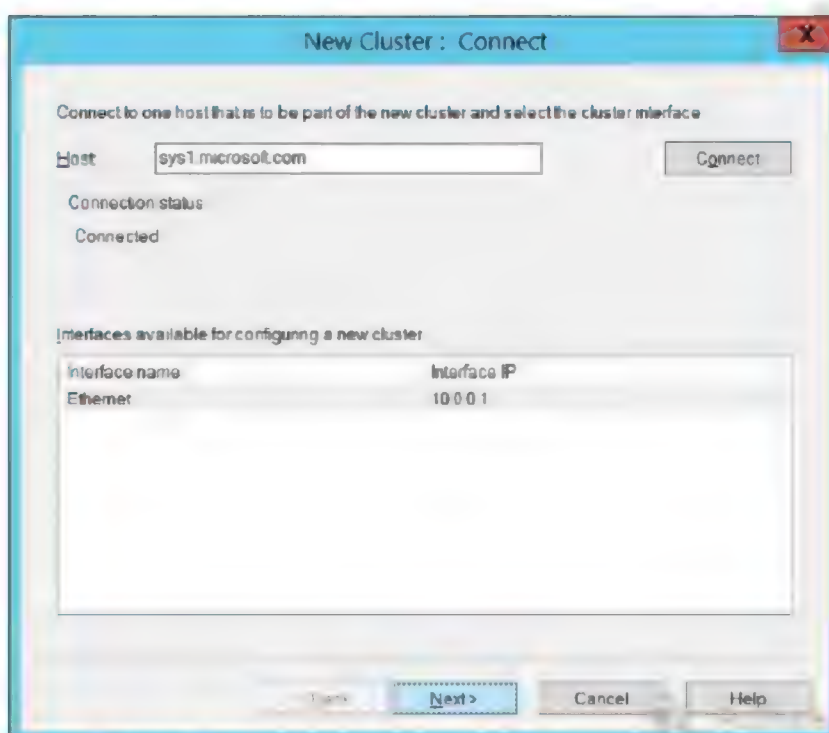
8. Go to Start, click **Network Load Balancing Manager**.



9. Click **Cluster**, select **New**.



10. Enter the host name **Sys1.microsoft.com** and click **Connect** and **Next**.





11. Verify the Priority and click **Next**.

**New Cluster : Host Parameters**

Priority (unique host identifier): 1

Dedicated IP addresses

IP address	Subnet mask
10.0.0.1	255.0.0.0

Add... Edit... Remove

Initial host state: Started

Default state: Started

☐ Retain suspended state after computer restarts

< Back Next > Cancel Help

12. Click **Add**

**New Cluster : Cluster IP Addresses**

The cluster IP addresses are shared by every member of the cluster for load balancing. The first IP address listed is considered the primary cluster IP address and used for cluster heartbeats.

Cluster IP addresses.

IP address	Subnet mask
------------	-------------

Add... Edit... Remove

< Back Next > Cancel Help

13. Enter **Cluster IP Address** (Ex: 10.0.0.100) and Subnet (Ex: 255.0.0.0)

**Add IP Address**

● Add IPv4 address:

IPv4 address: 10.0.0.100

Subnet: 255.0.0.0

Add IPv6 address:

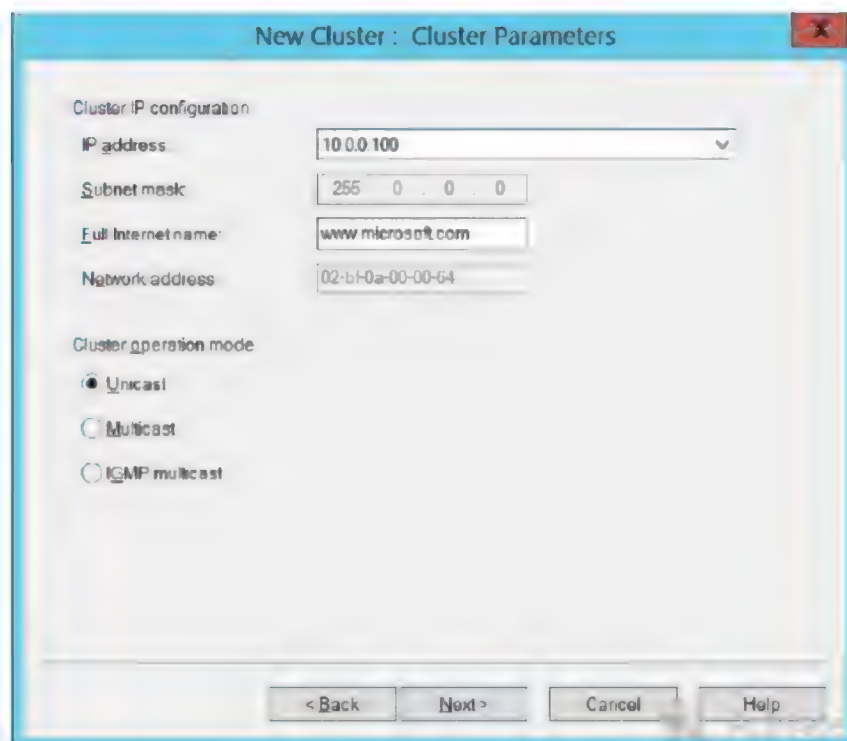
IPv6 address:

☐ Generate IPv6 addresses:

☐ Link local ☐ Anycast ☐ Global

OK Cancel

14. Enter the Full Internet Name (Ex: **www.microsoft.com**)



**New Cluster: Cluster Parameters**

Cluster IP configuration

IP address: 10.0.0.100

Subnet mask: 255.0.0.0

Full Internet name: **www.microsoft.com**

Network address: 02-b1-0a-00-00-64

Cluster operation mode

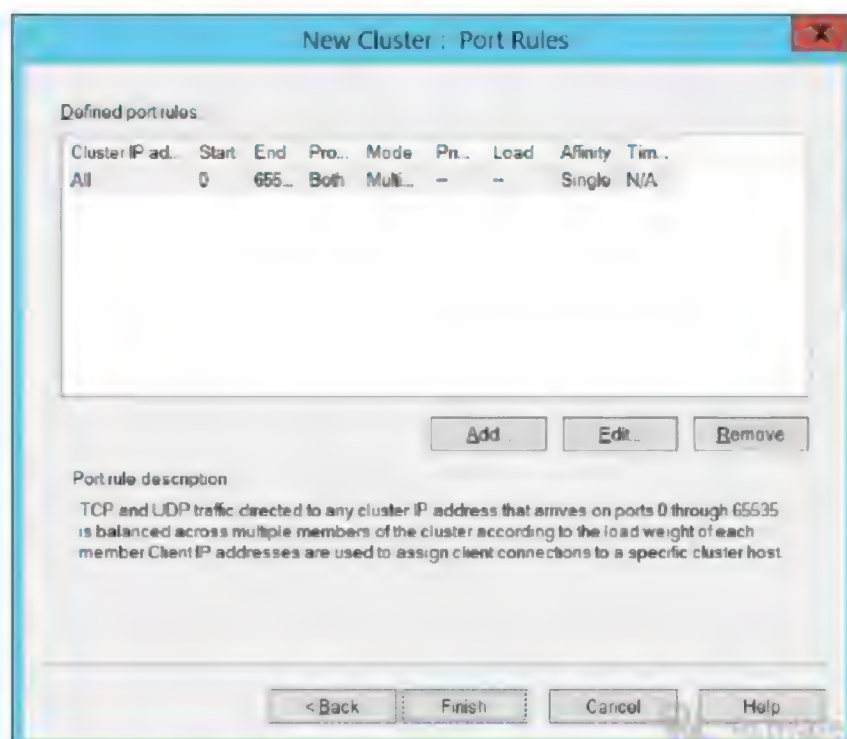
☒ Unicast

☐ Multicast

☐ IGMP multicast

< Back Next > Cancel Help

15. Click **Finish**.



**New Cluster: Port Rules**

Defined port rules:

Cluster IP ad...	Start	End	Pro...	Mode	Pri...	Load	Afinity	Tim...
All	0	655...	Both	Mult...	-	-	Single	N/A

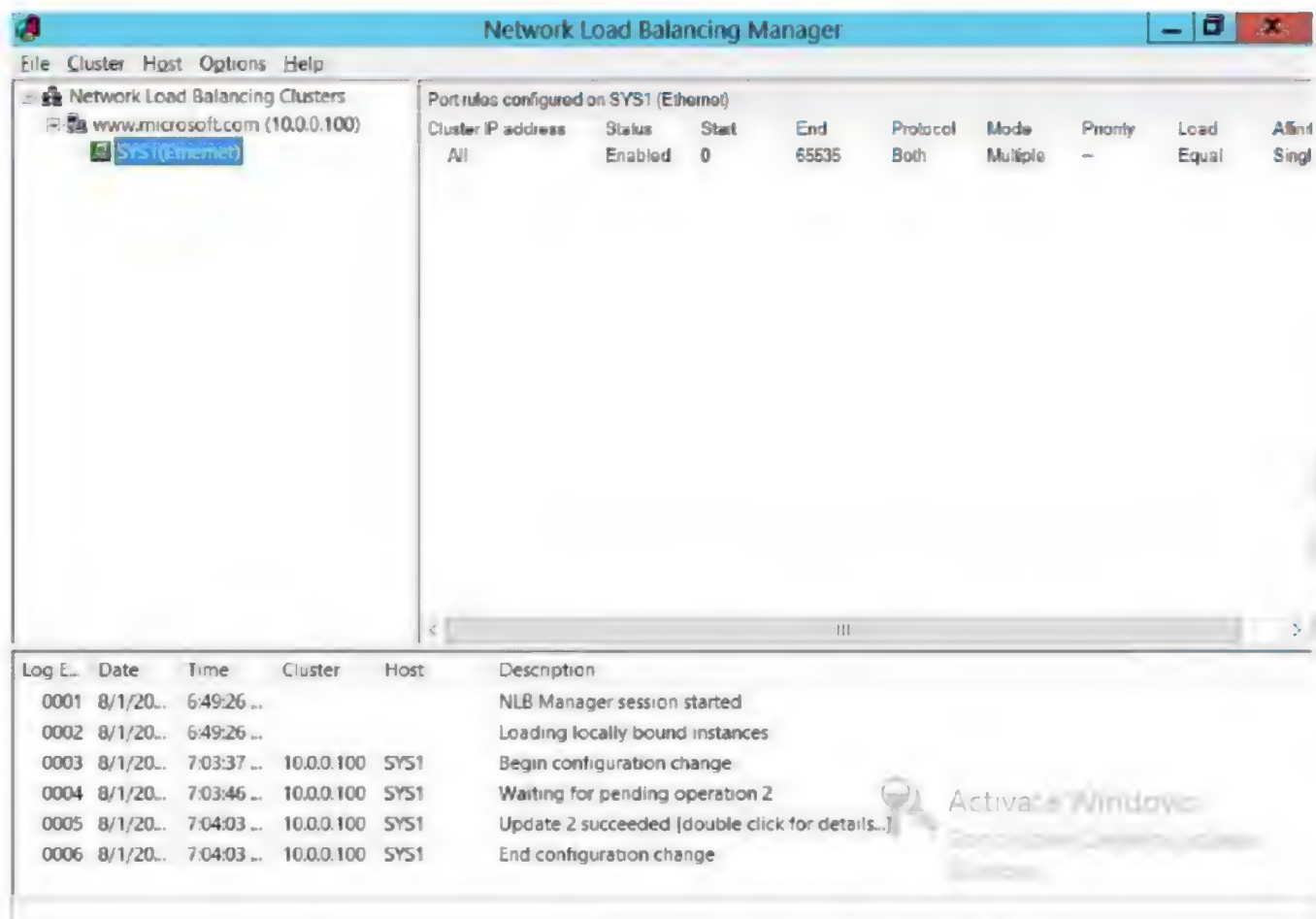
Add Edit Remove

Port rule description

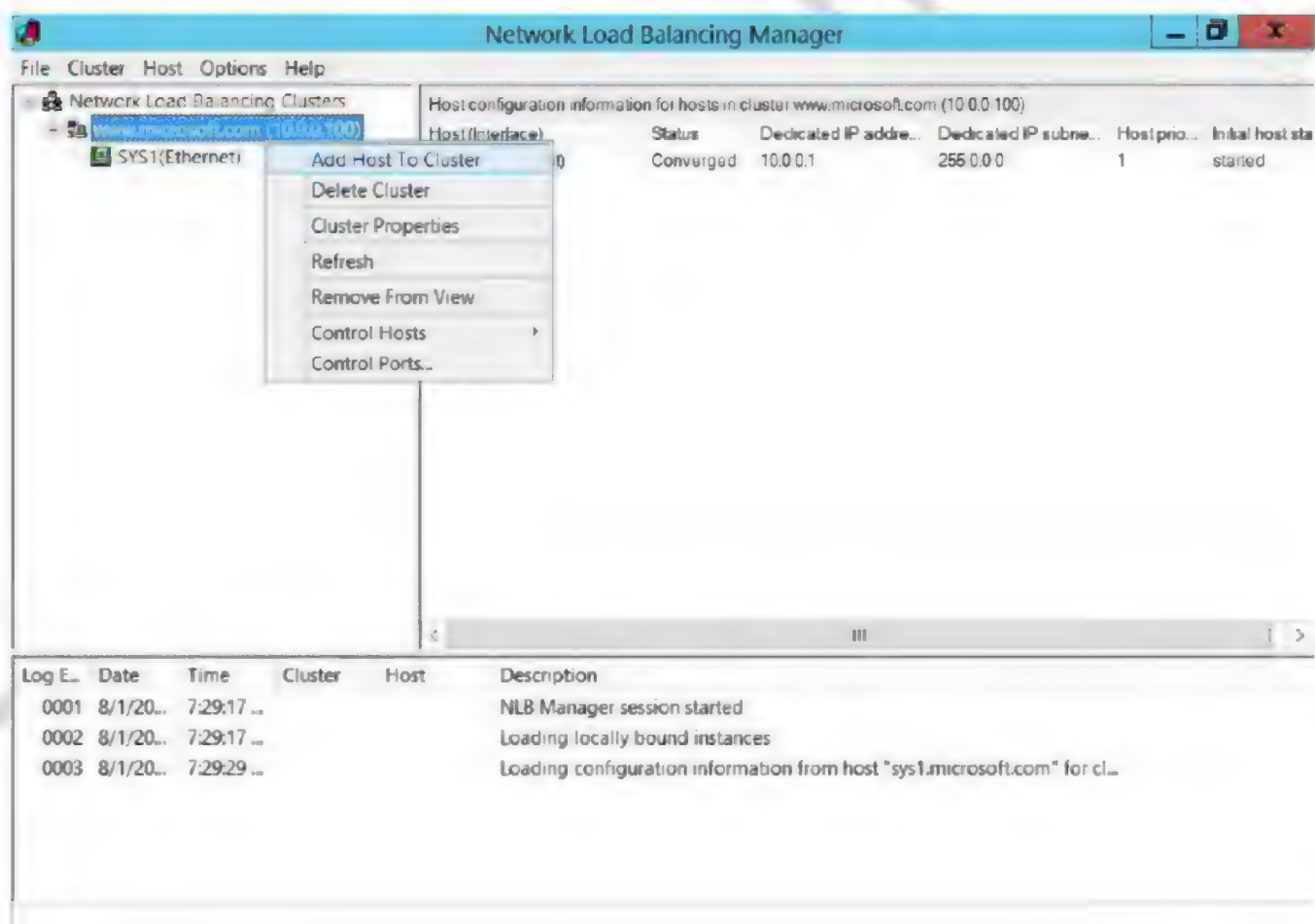
TCP and UDP traffic directed to any cluster IP address that arrives on ports 0 through 65535 is balanced across multiple members of the cluster according to the load weight of each member. Client IP addresses are used to assign client connections to a specific cluster host.

< Back Finish Cancel Help

16. Verify for **Sys1** added as host in Cluster.

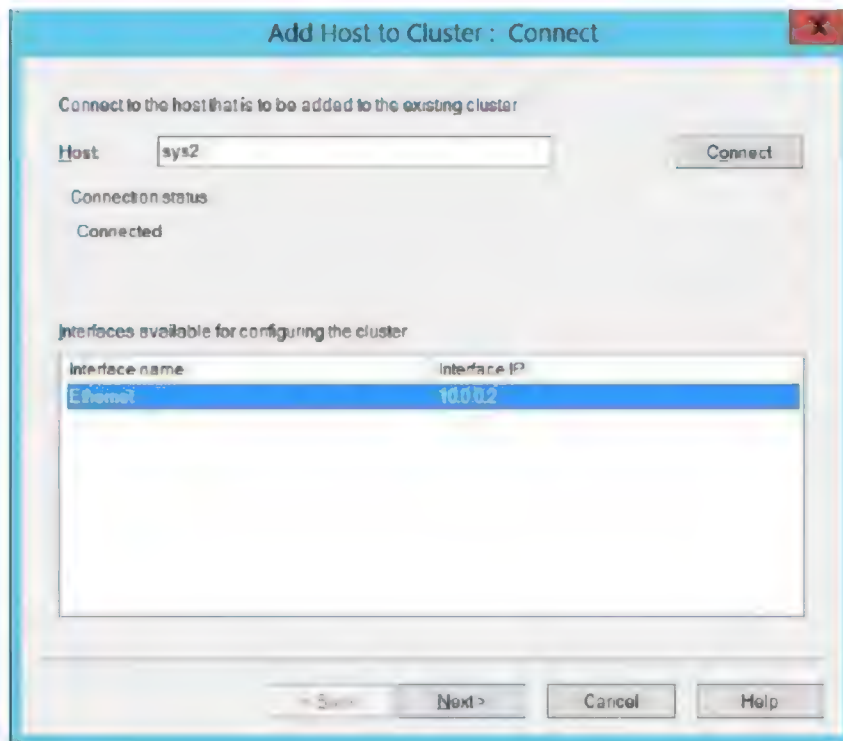


17. Right click on the Cluster (Ex: **www.microsoft.com**), select **AddHosttoCluster**.

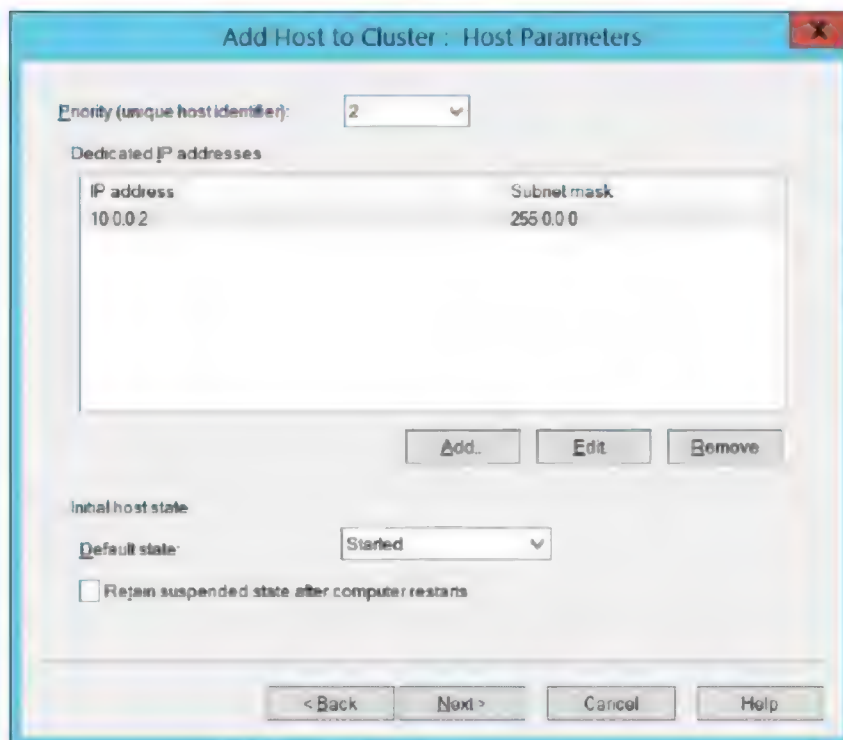




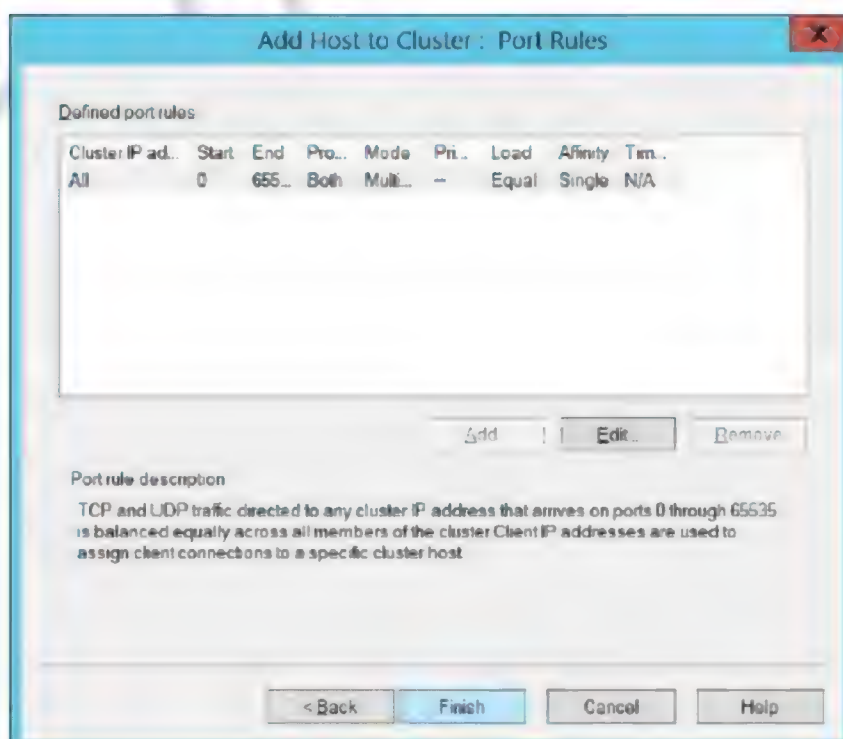
18. Enter Host name **SYS2**, click **Connect** and **Next**.



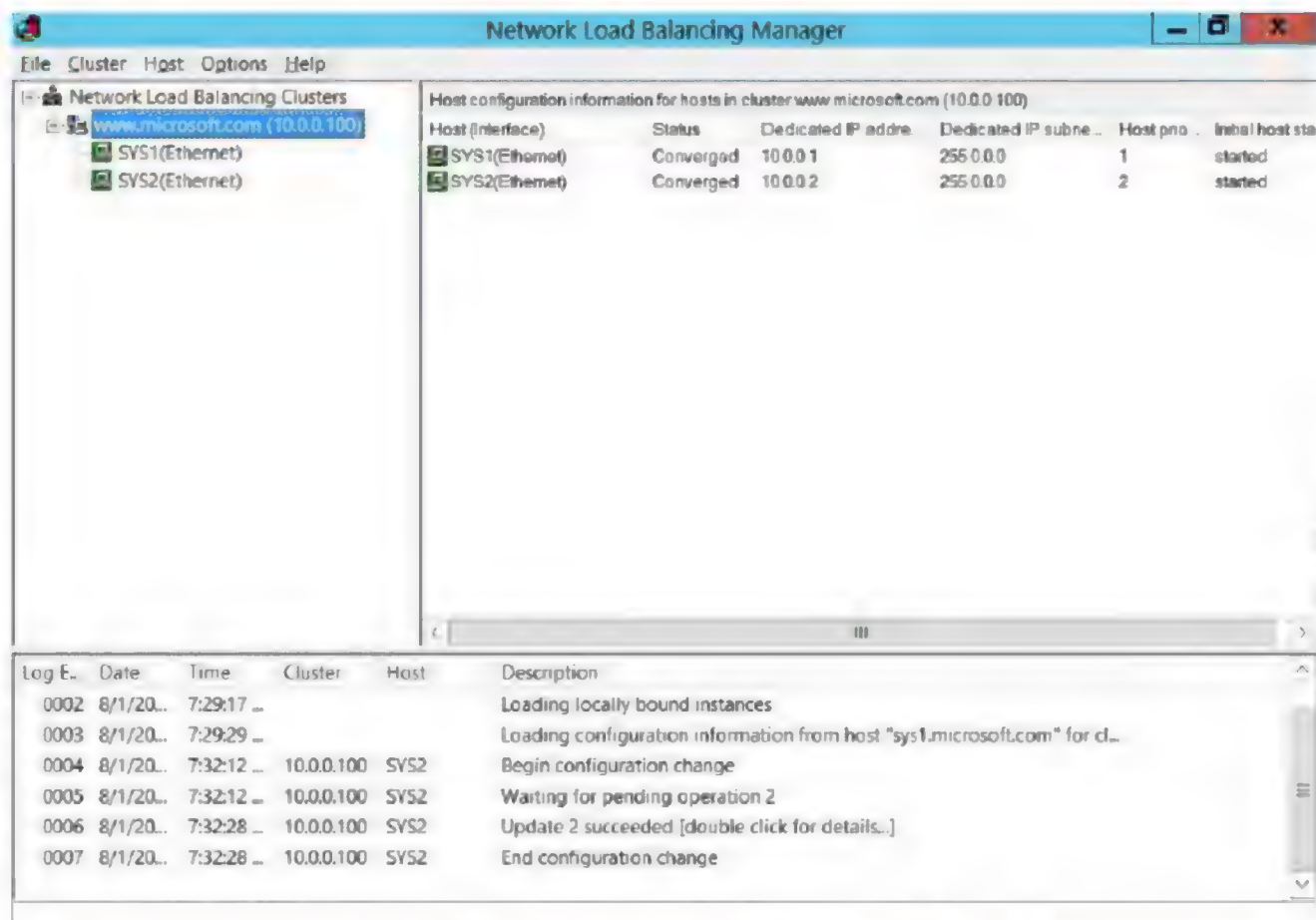
19. Verify the Priority and click **Next**.



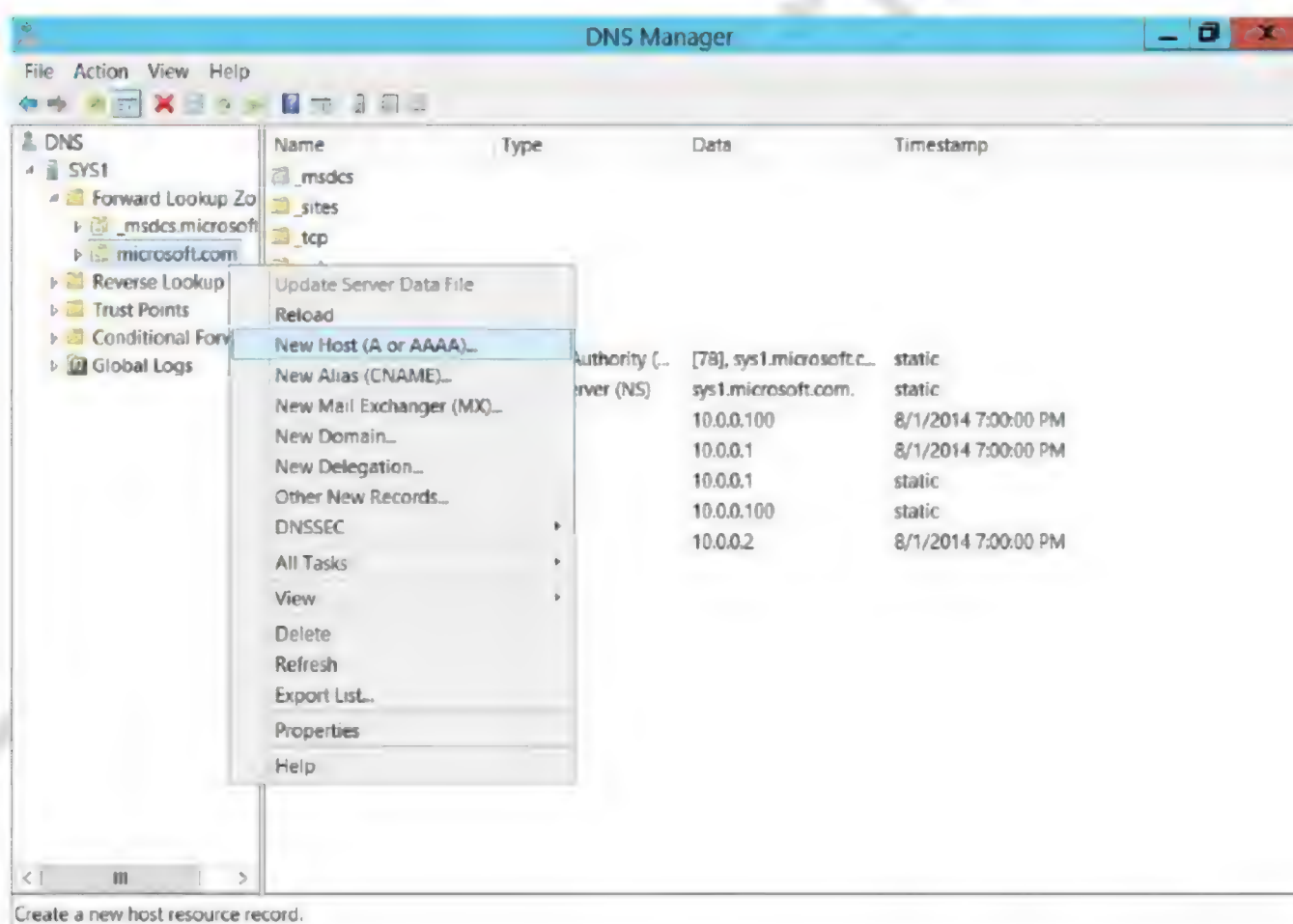
20. Click **Finish**.



21. Verify the hosts in status of Converged.



22. Configure DNS Host record for Cluster IP Address.



23. Verify for the Host record www.microsoft.com mapped to 10.0.0.100.

## Lab – 84: Installing Active Directory Certificate Services

### Objective:

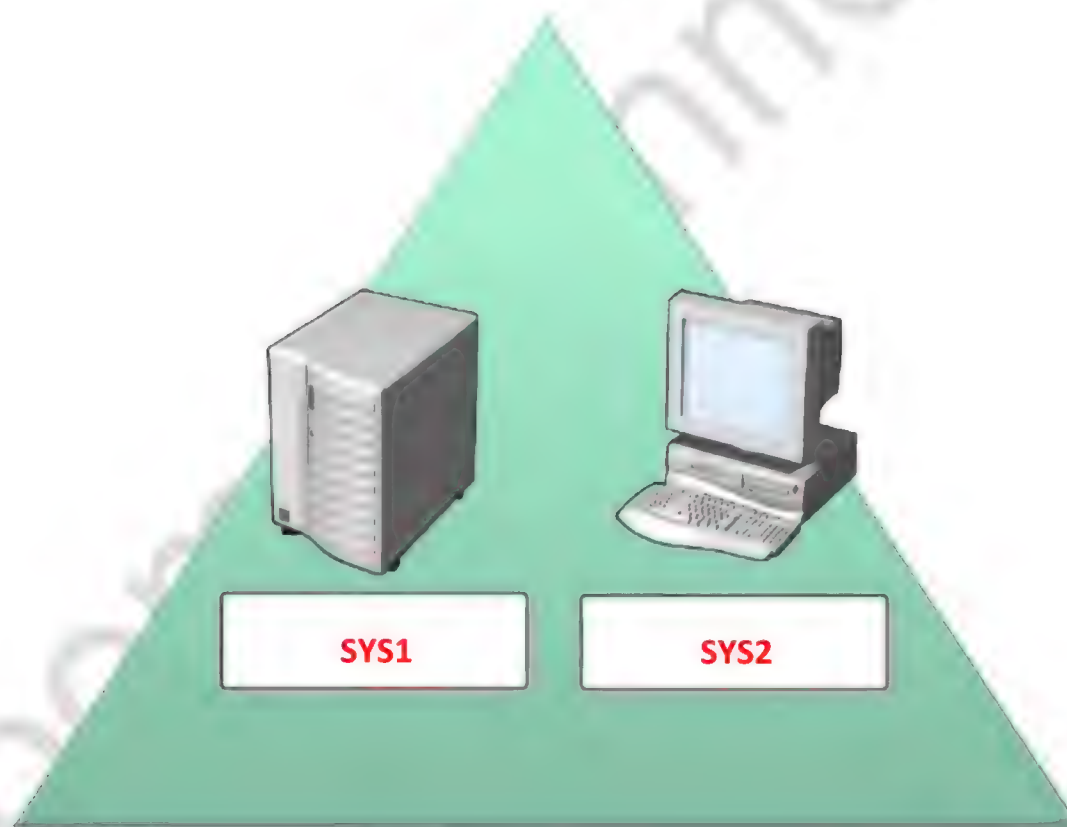
To Provide Digital Certificates to Users using AD Certificate Services

### Pre-requisites:

Before working on this lab, you must have

- A computer running windows 2012 server Domain Controller.
- A computer running windows 2012 server or windows 7.

### Topology:



#### SYS1

##### Domain Controller

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

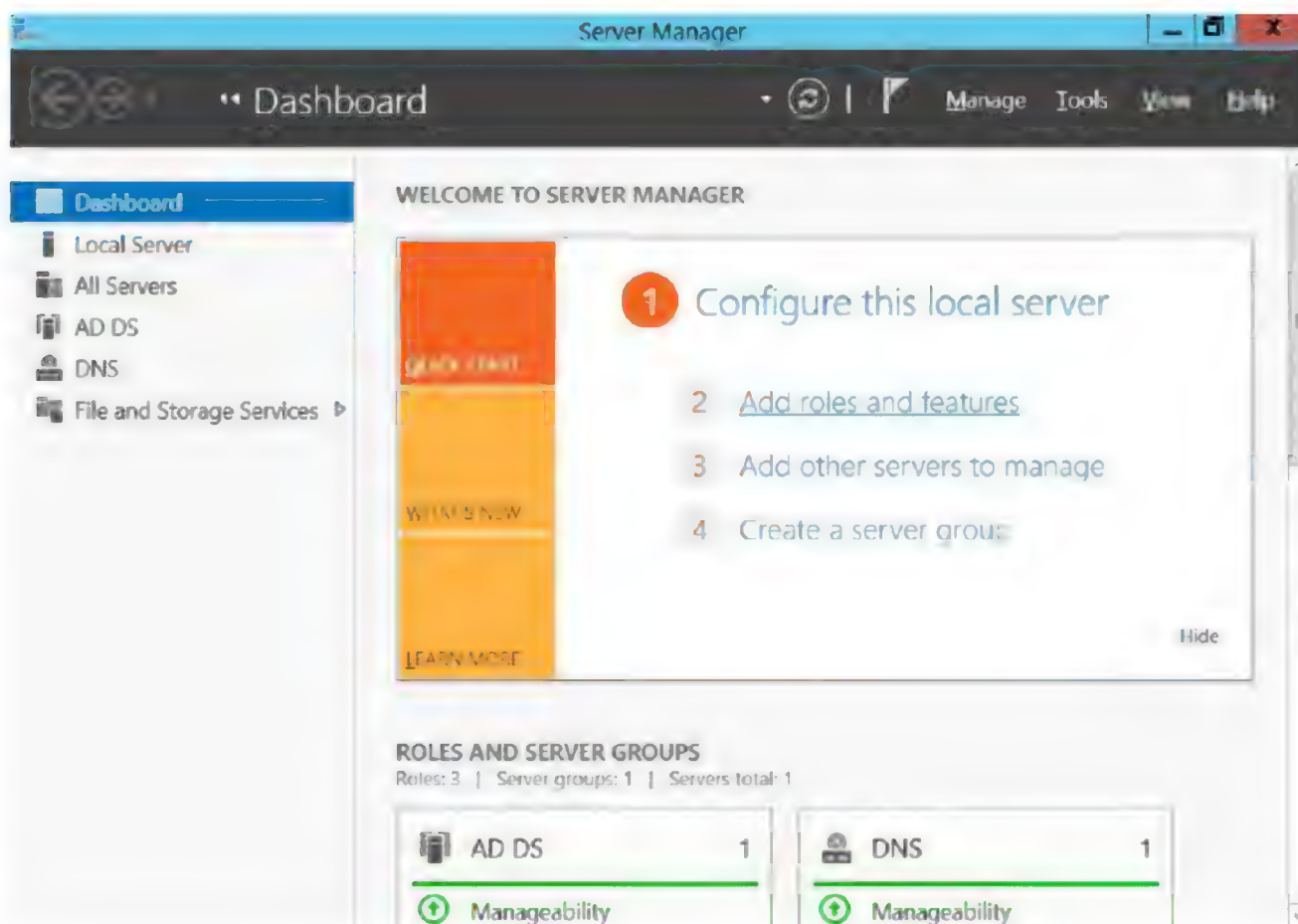
#### SYS2

##### Member Server / Client

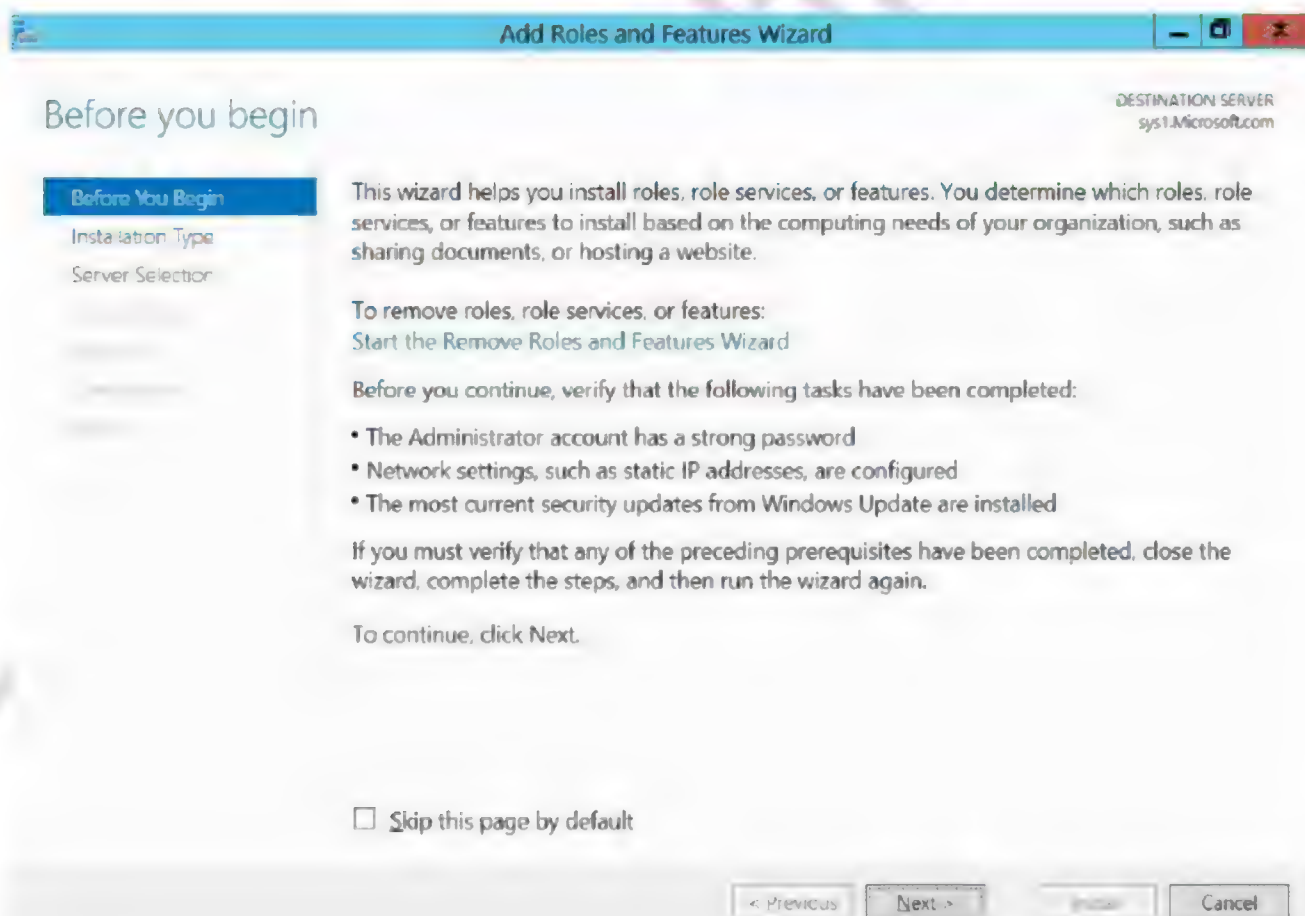
IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1



1. In Server Manager Dashboard, click **Add roles and features**.



2. In Before you begin page, click **Next**.



3. In Select installation type, select **Role-based or feature-based installation**, click **Next**.

**Add Roles and Features Wizard**

DESTINATION SERVER  
sys1.Microsoft.com

Select installation type

Before You Begin  
**Installation Type**  
Server Selection

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

- ☒ **Role-based or feature-based installation**  
Configure a single server by adding roles, role services, and features.
- ☐ **Remote Desktop Services installation**  
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

< Previous   Next >   Finish   Cancel

4. In Select destination server, from Server Pool select **SYS1**, click **Next**.

**Add Roles and Features Wizard**

DESTINATION SERVER  
sys1.Microsoft.com

Select destination server

Before You Begin  
Installation Type  
**Server Selection**  
Server Roles  
Features

Select a server or a virtual hard disk on which to install roles and features.

- ☒ Select a server from the server pool
- ☐ Select a virtual hard disk

**Server Pool**

Filter:

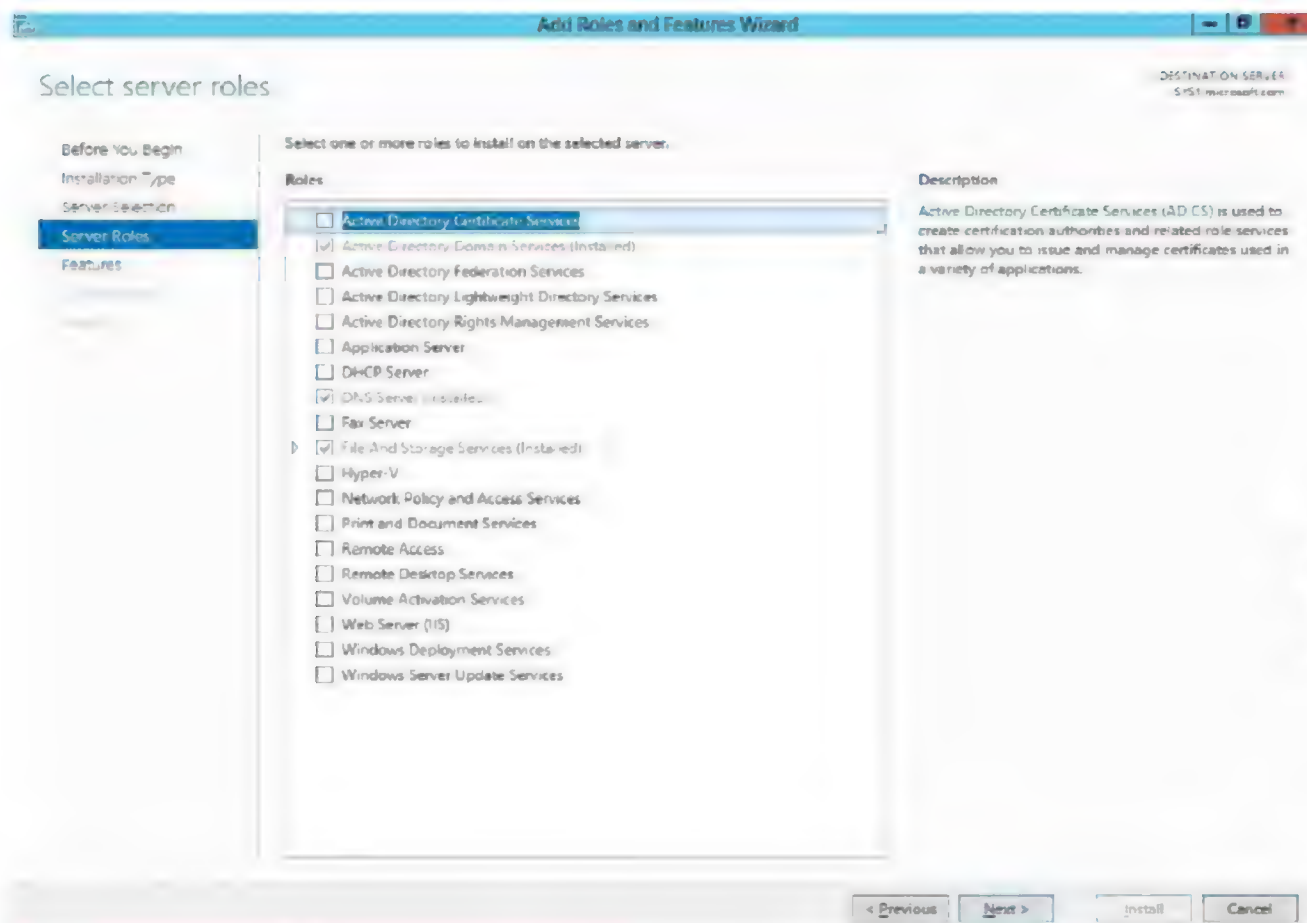
Name	IP Address	Operating System
sys1.Microsoft.com	10.0.0.1	Microsoft Windows Server 2012 Standard Evaluation

1 Computer(s) found

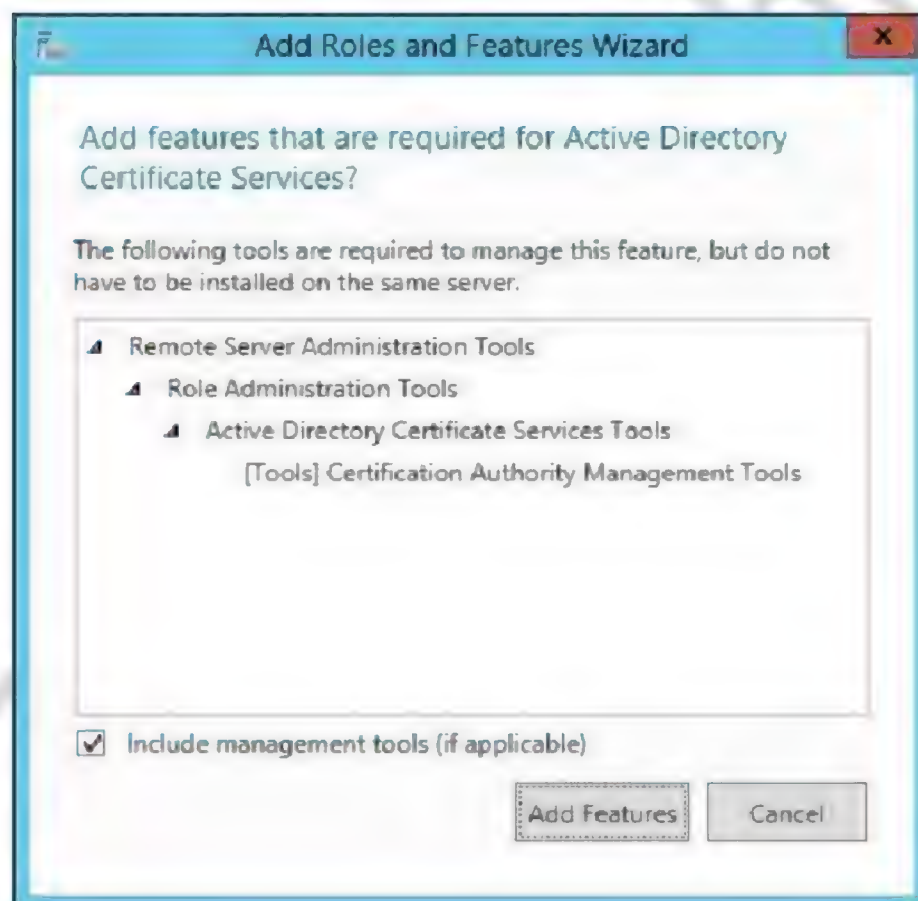
This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

< Previous   Next >   Finish   Cancel

5. Check the box **Active Directory Certificate Services**

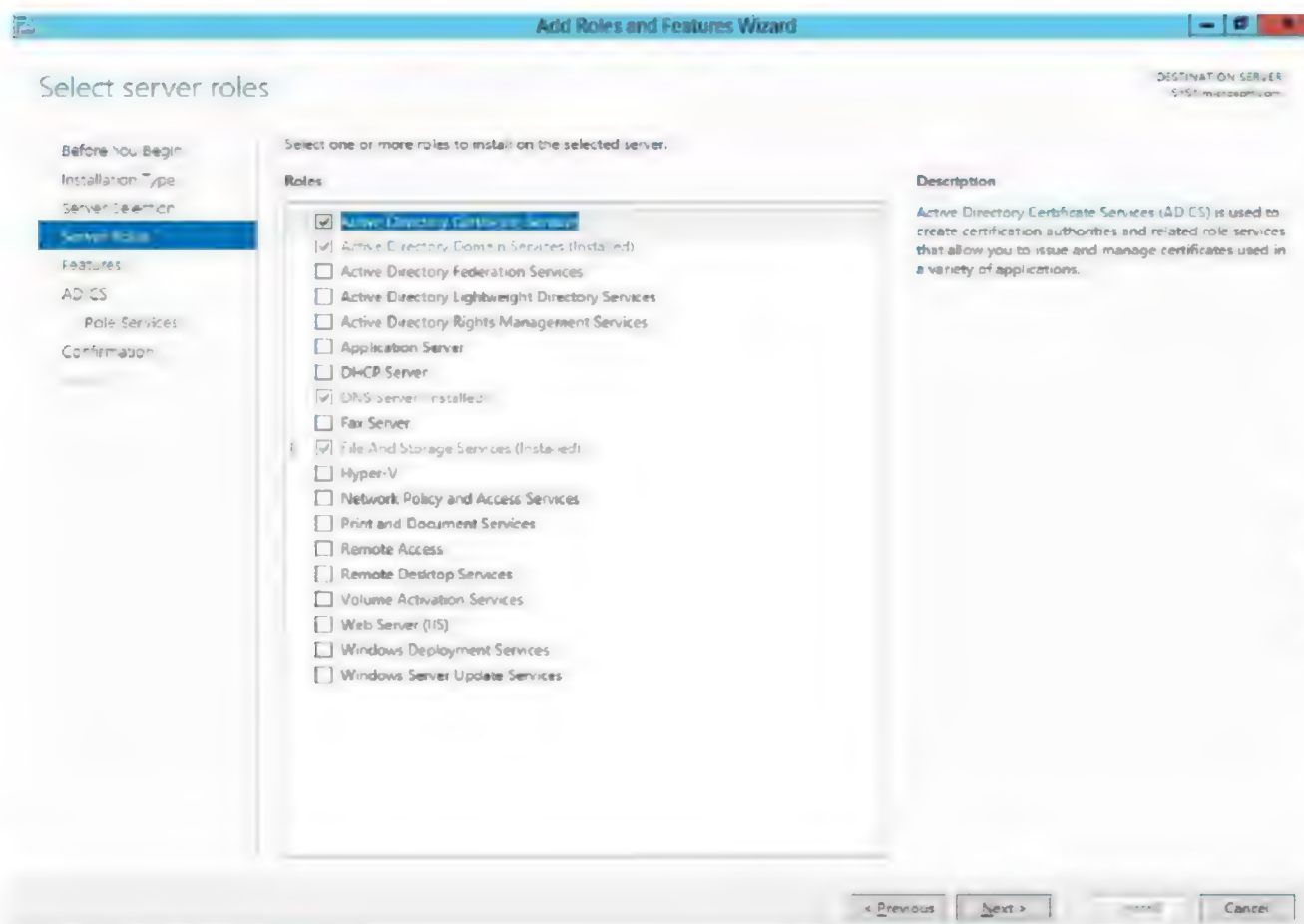


6. Click **Add Features**, to install the required features for **Active Directory Certificate Services**→Click **Next**.

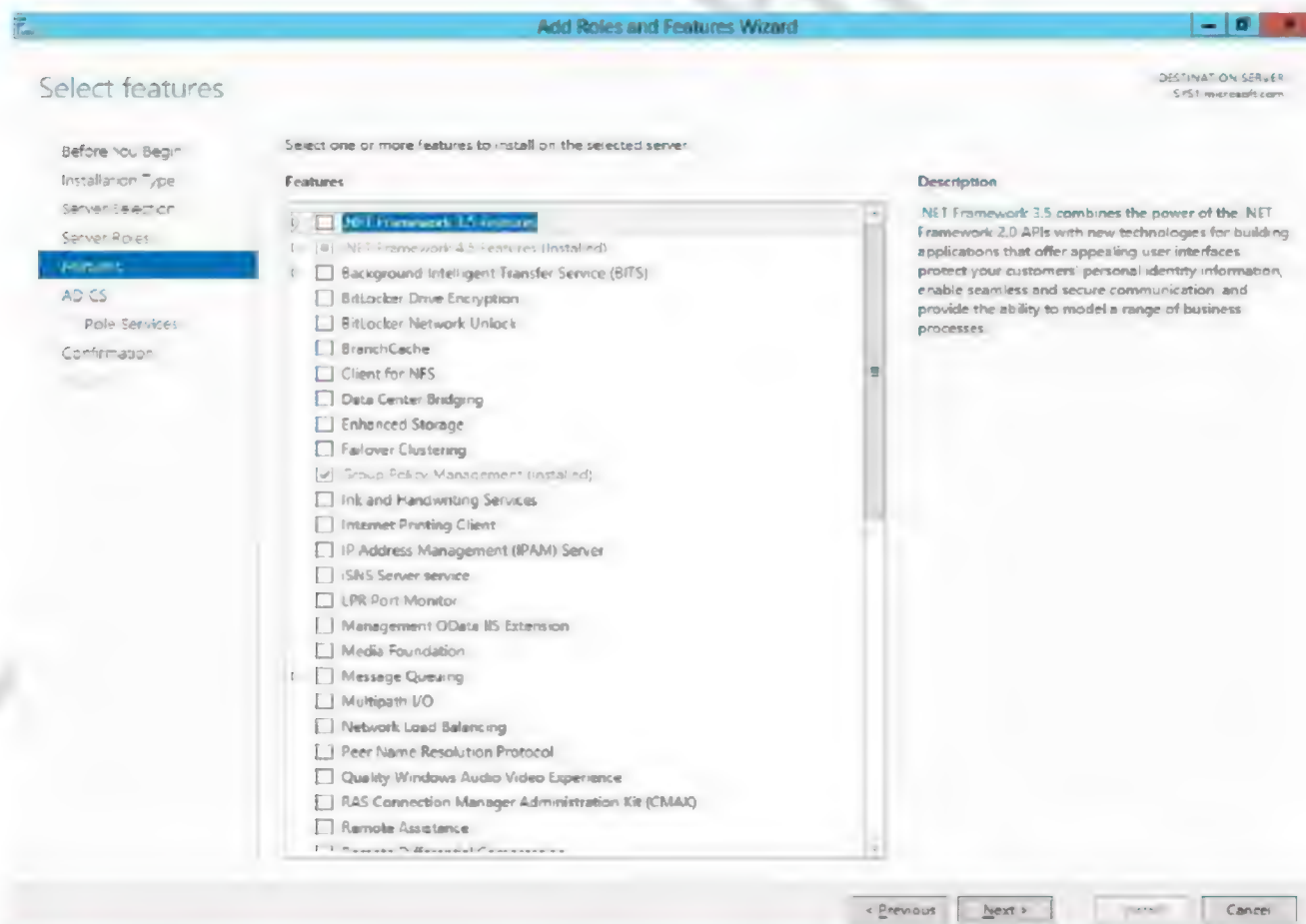




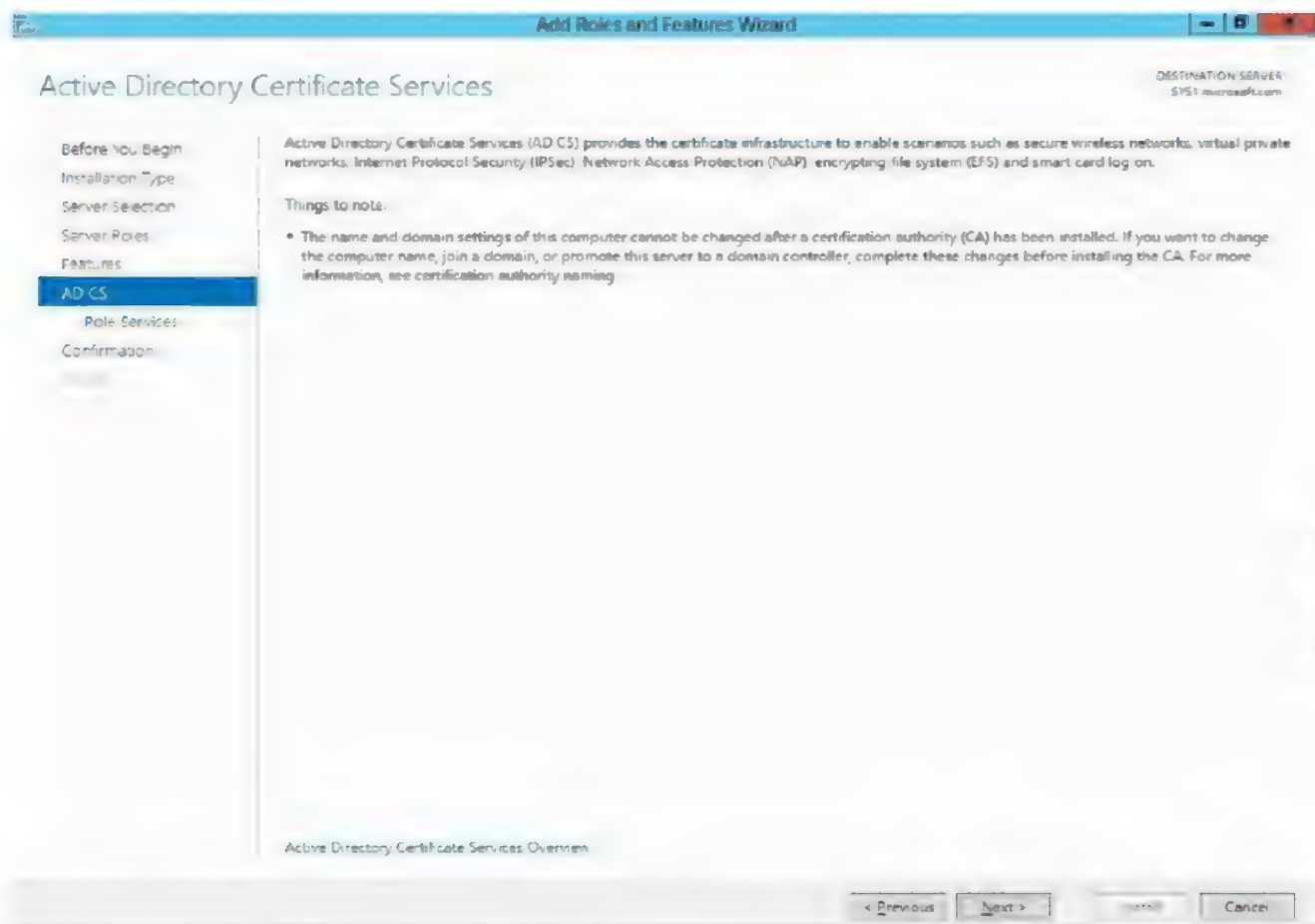
## 7. Click Next



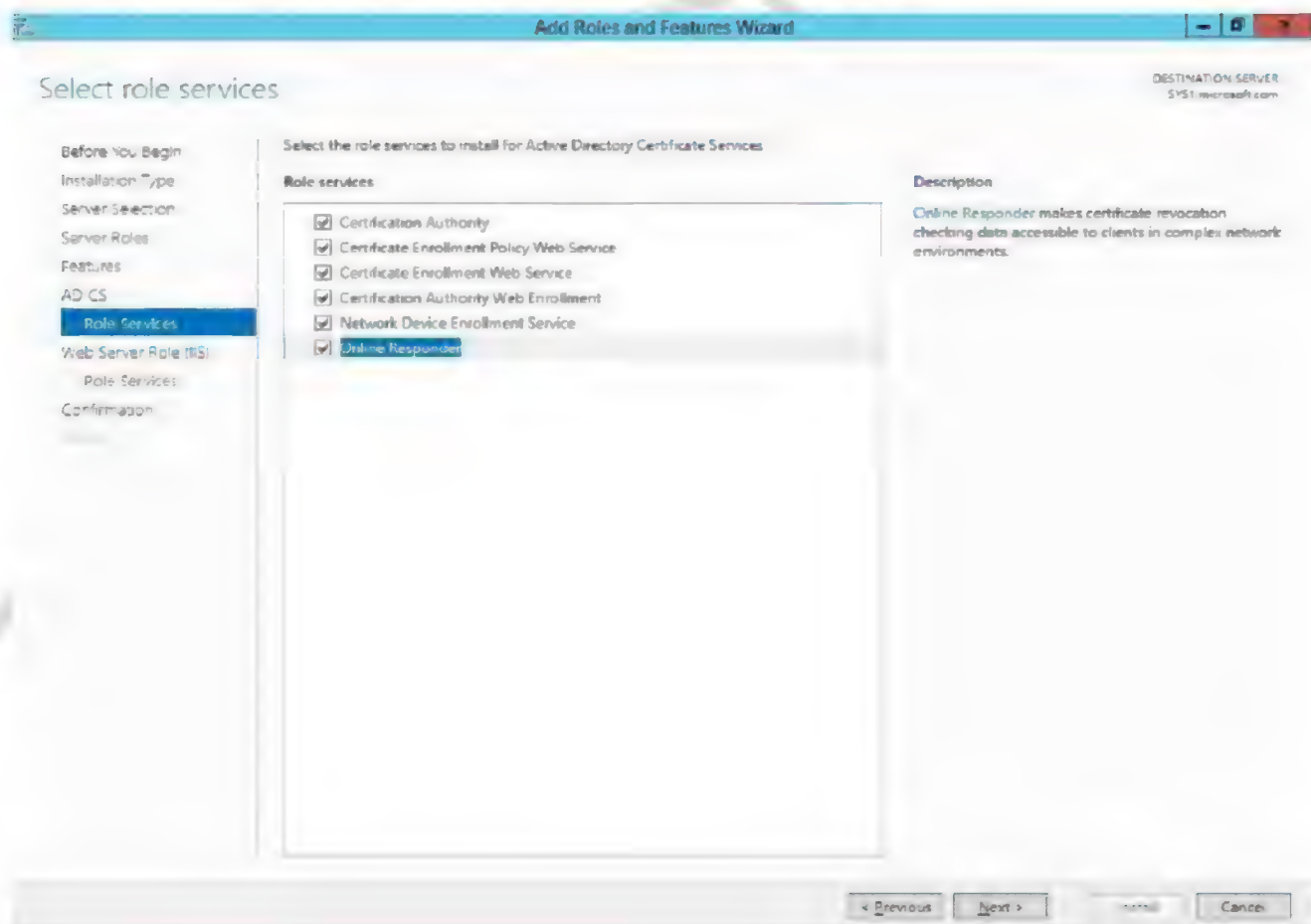
## 8. Click Next



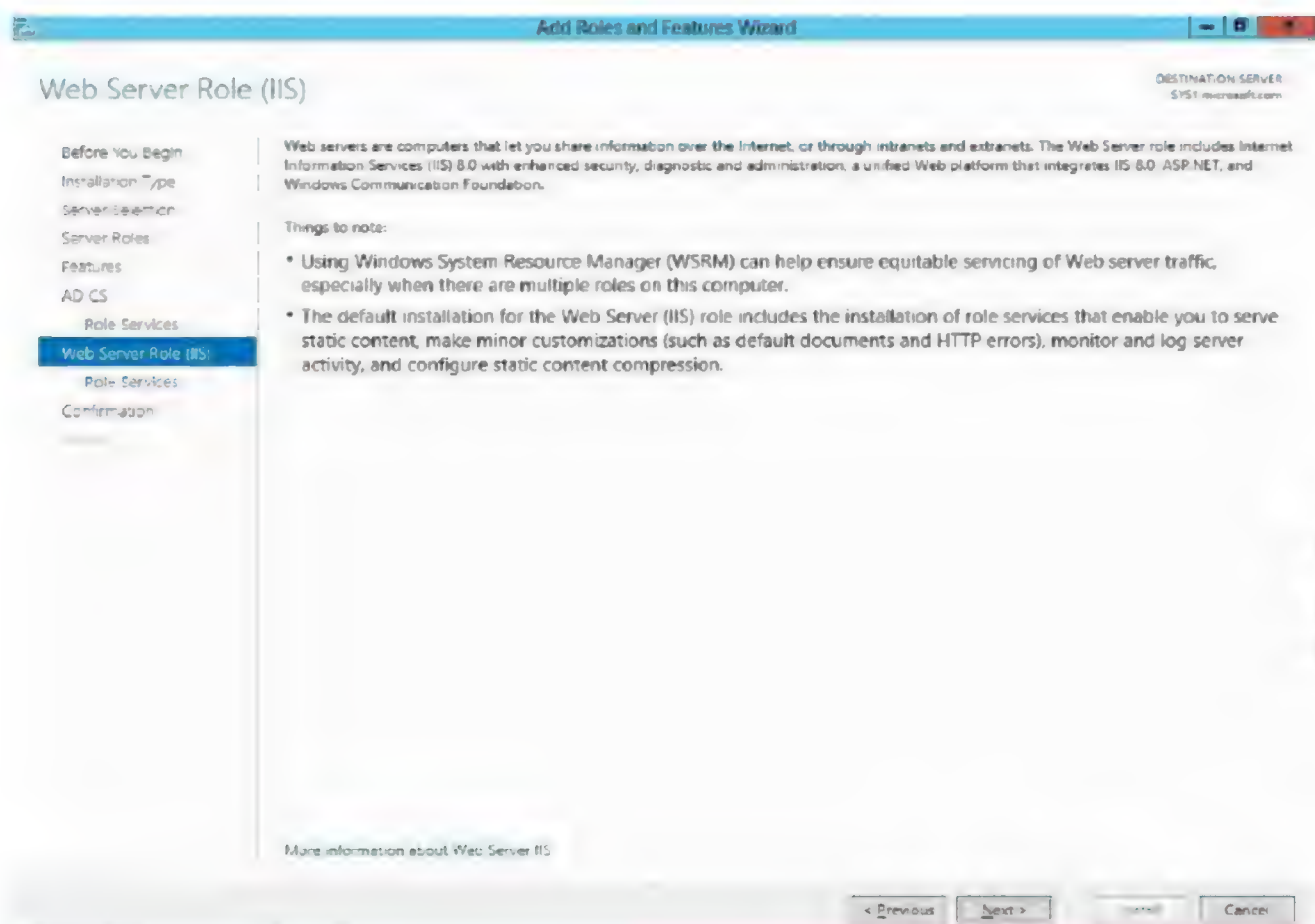
9. Click Next



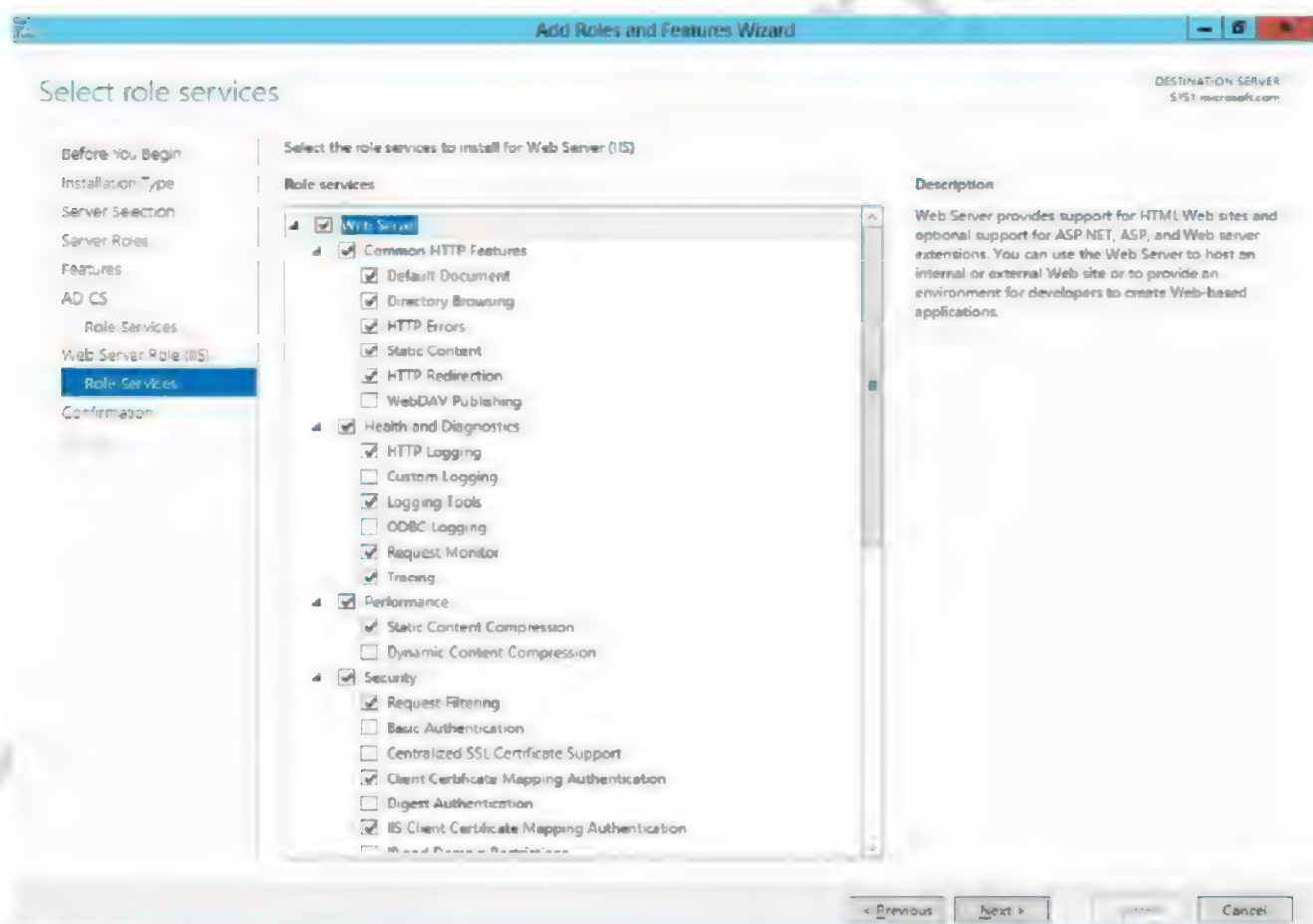
10. Check the boxes **Certificate Authority, Certificate Enrollment Policy Web Service, Certificate Enrollment Web Service, Certification Authority Web Enrollment, Network Device Enrollment Service & Online Responder**→click Next



## 11. Click Next

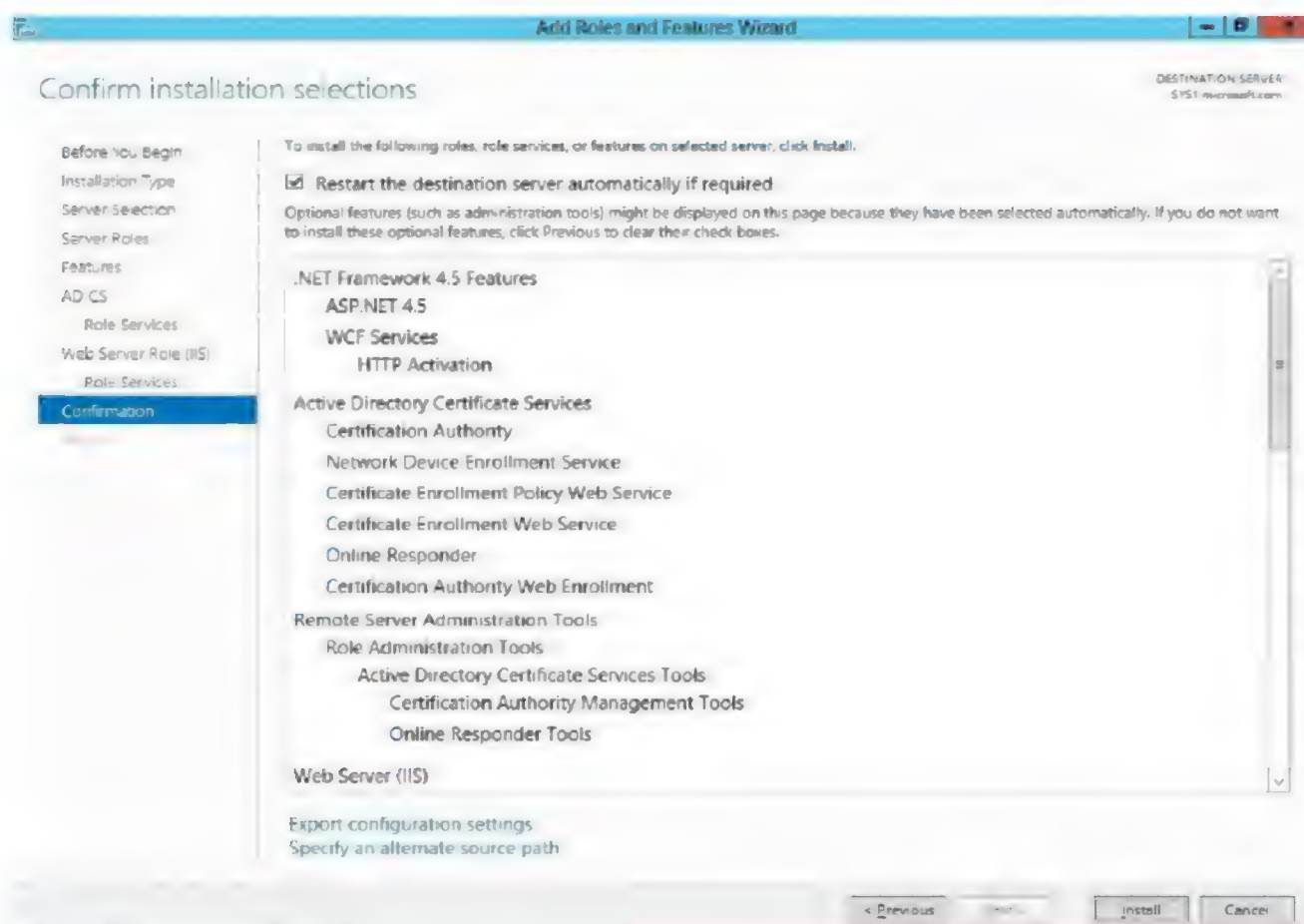


## 12. Click Next

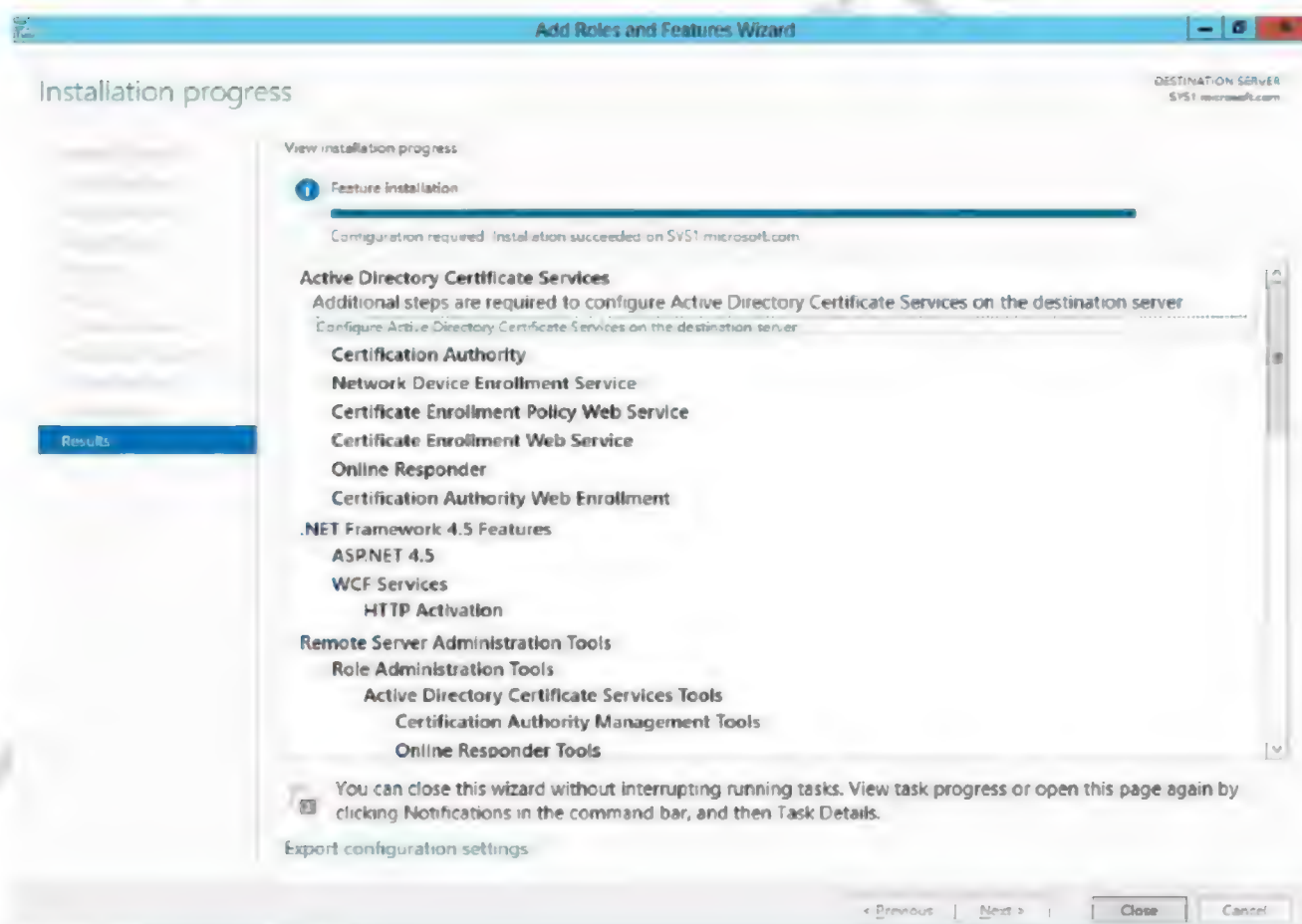




13. Check the box restart the destination server automatically if required → click **Next**



14. Click **Configure Active Directory Services** on the destination server



15. Click **Next**

AD CS Configuration

DESTINATION SERVER  
SYSLmicrosoft.com

Credentials

Specify credentials to configure role services

To install the following role services you must belong to the local Administrators group:

- Standalone certification authority
- Certification Authority Web Enrollment
- Online Responder

To install the following role services you must belong to the Enterprise Admins group:

- Enterprise certification authority
- Certificate Enrollment Policy Web Service
- Certificate Enrollment Web Service
- Network Device Enrollment Service

Credentials: MICROSOFT\Administrator Change...

More about AD CS Server Roles

< Previous Next > Configure Cancel

16. Check the boxes **Certificate Authority**, **Certification Authority Web Enrollment** & **Online Responder** → click **Next**

AD CS Configuration

DESTINATION SERVER  
SYSLmicrosoft.com

Role Services

Select Role Services to configure

- ☒ Certification Authority
- ☒ Certification Authority Web Enrollment
- ☒ Online Responder
- ☐ Network Device Enrollment Service
- ☐ Certificate Enrollment Web Service
- ☐ Certificate Enrollment Policy Web Service

More about AD CS Server Roles

< Previous Next > Configure Cancel

17. Click Next

AD CS Configuration

DESTINATION SERVER  
SYS1.microsoft.com

Setup Type

Credentials  
Role Services  
**Setup Type**  
CA Type  
Private Key  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation

Specify the setup type of the CA

Enterprise certification authorities (CAs) can use Active Directory Domain Services (AD DS) to simplify the management of certificates. Standalone CAs do not use AD DS to issue or manage certificates.

☒ Enterprise CA  
Enterprise CAs must be domain members and are typically online to issue certificates or certificate policies.

☐ Standalone CA  
Standalone CAs can be members of a workgroup or domain. Standalone CAs do not require AD DS and can be used without a network connection (offline).

More about Setup Type

< Previous Next > Configure Cancel

18. Click Next

AD CS Configuration

DESTINATION SERVER  
SYS1.microsoft.com

CA Type

Credentials  
Role Services  
Setup Type  
**CA Type**  
Private Key  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation

Specify the type of the CA

When you install Active Directory Certificate Services (AD CS), you are creating or extending a public key infrastructure (PKI) hierarchy. A root CA is at the top of the PKI hierarchy and issues its own self-signed certificate. A subordinate CA receives a certificate from the CA above it in the PKI hierarchy.

☒ Root CA  
Root CAs are the first and may be the only CAs configured in a PKI hierarchy.

☐ Subordinate CA  
Subordinate CAs require an established PKI hierarchy and are authorized to issue certificates by the CA above them in the hierarchy.

More about CA Type

< Previous Next > Configure Cancel



## 19. Click Next

The screenshot shows the 'Private Key' step of the 'AD CS Configuration' wizard. The left-hand navigation pane lists the following steps: Credentials, Role Services, Setup Type, CA Type, Private Key (highlighted), Cryptography, CA Name, Validity Period, Certificate Database, and Confirmation. The main pane is titled 'Specify the type of the private key'. It contains the following text: 'To generate and issue certificates to clients, a certification authority (CA) must have a private key.' Below this, there are two radio button options: 'Create a new private key' (which is selected) and 'Use existing private key'. Under 'Create a new private key', there is a sub-option 'Use this option if you do not have a private key or want to create a new private key.' Under 'Use existing private key', there are three sub-options: 'Select a certificate and use its associated private key', 'Select this option if you have an existing certificate on this computer or if you want to import a certificate and use its associated private key', and 'Select an existing private key on this computer'. At the bottom of the main pane, there is a link 'More about Private Key'. The bottom of the wizard has four buttons: '< Previous', 'Next >', 'Configure', and 'Cancel'.

## 20. Select SHA1 → click Next

The screenshot shows the 'Cryptography for CA' step of the 'AD CS Configuration' wizard. The left-hand navigation pane lists the following steps: Credentials, Role Services, Setup Type, CA Type, Private Key, Cryptography (highlighted), CA Name, Validity Period, Certificate Database, and Confirmation. The main pane is titled 'Specify the cryptographic options'. It contains the following elements: 'Select a cryptographic provider:' with a dropdown menu showing 'RSA#Microsoft Software Key Storage Provider'; 'Key length:' with a dropdown menu showing '2048'; 'Select the hash algorithm for signing certificates issued by this CA:' with a list box containing 'SHA256', 'SHA384', 'SHA512', 'SHA1', 'MD5', 'MD4', and 'MD2'; and a checkbox 'Allow administrator interaction when the private key is accessed by the CA.' which is currently unchecked. At the bottom of the main pane, there is a link 'More about Cryptography'. The bottom of the wizard has four buttons: '< Previous', 'Next >', 'Configure', and 'Cancel'.

## 21. Click Next

The screenshot shows the 'AD CS Configuration' wizard window. The title bar says 'AD CS Configuration'. In the top right corner, it says 'DESTINATION SERVER: SYS1.microsoft.com'. On the left, there is a list of steps: Credentials, Role Services, Setup Type, CA Type, Private Key, Cryptography, **CA Name**, Validity Period, Certificate Database, and Confirmation. The 'CA Name' step is currently selected and highlighted in blue. The main area of the wizard is titled 'Specify the name of the CA'. It contains the following text: 'Type a common name to identify this certification authority (CA). This name is added to all certificates issued by the CA. Distinguished name suffix values are automatically generated but can be modified.' Below this, there are two text boxes: 'Common name for this CA:' with the value 'microsoft-SYS1-CA' and 'Distinguished name suffix:' with the value 'DC=microsoft,DC=com'. Below these, there is a 'Preview of distinguished name:' showing 'CN=microsoft-SYS1-CA,DC=microsoft,DC=com'. At the bottom left of the main area, there is a link 'More about CA Name'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Configure', and 'Cancel'.

## 22. Click Next

The screenshot shows the 'AD CS Configuration' wizard window. The title bar says 'AD CS Configuration'. In the top right corner, it says 'DESTINATION SERVER: SYS1.microsoft.com'. On the left, there is a list of steps: Credentials, Role Services, Setup Type, CA Type, Private Key, Cryptography, CA Name, **Validity Period**, Certificate Database, and Confirmation. The 'Validity Period' step is currently selected and highlighted in blue. The main area of the wizard is titled 'Specify the validity period'. It contains the following text: 'Select the validity period for the certificate generated for this certification authority (CA):'. Below this, there is a dropdown menu showing '5' and 'Years'. Below the dropdown, it says 'CA expiration Date: 7/29/2020 12:25:00 PM'. Below that, there is a note: 'The validity period configured for this CA certificate should exceed the validity period for the certificates it will issue'. At the bottom left of the main area, there is a link 'More about Validity Period'. At the bottom right, there are four buttons: '< Previous', 'Next >', 'Configure', and 'Cancel'.

23. Click Next

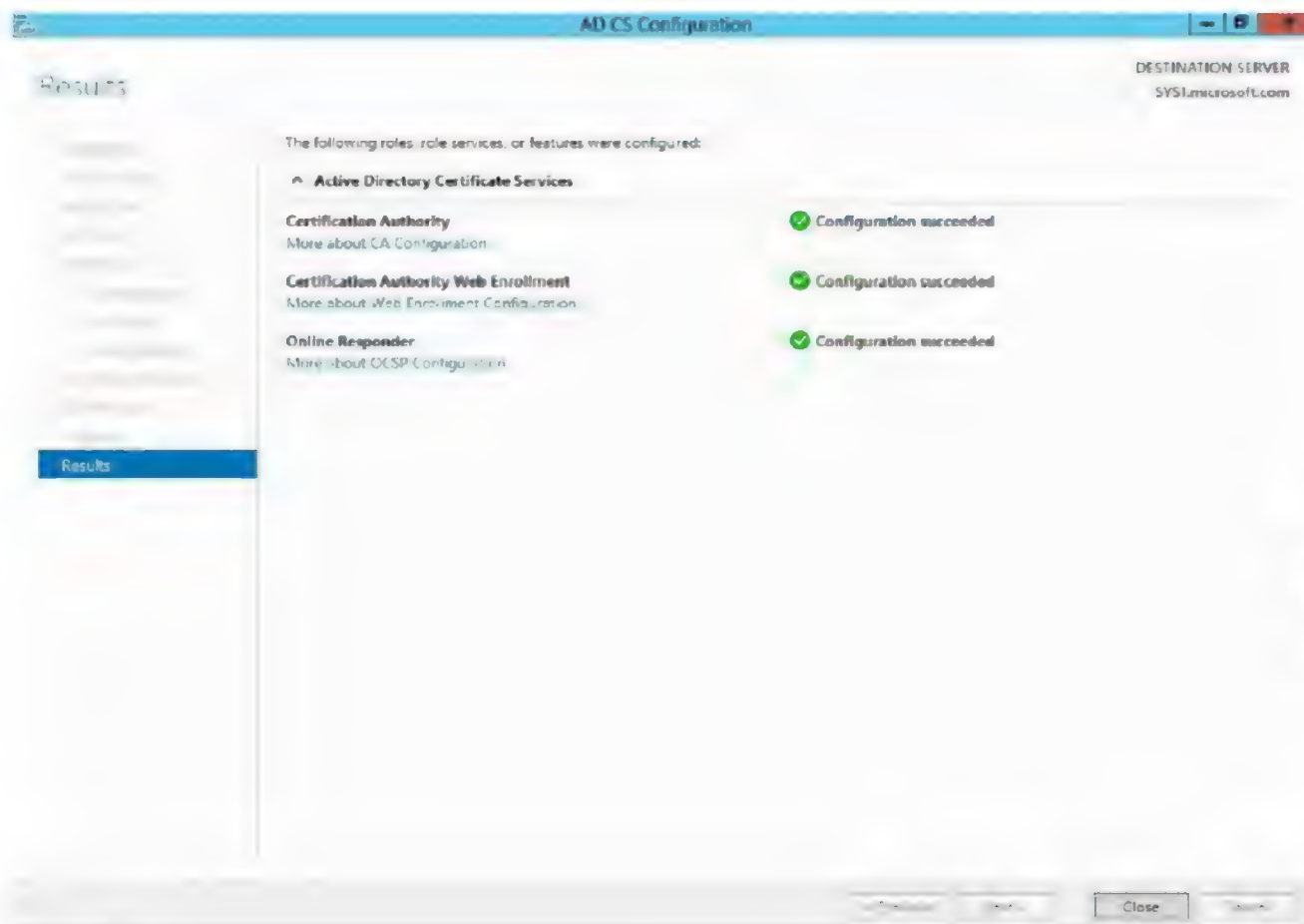
The screenshot shows the 'AD CS Configuration' wizard at the 'CA Database' step. The left pane lists steps: Credentials, Role Services, Setup Type, CA Type, Private Key, Cryptography, CA Name, Validity Period, **CA Database**, and Confirmation. The main pane is titled 'Specify the database locations' and contains two fields: 'Certificate database location' and 'Certificate database log location', both set to 'C:\Windows\system32\CertLog'. A 'More about CA Database' link is at the bottom. The right pane shows 'DESTINATION SERVER' as 'SYS1.microsoft.com'. Navigation buttons at the bottom are '< Previous', 'Next >', 'Finish', and 'Cancel'.

24. Click Configure

The screenshot shows the 'AD CS Configuration' wizard at the 'Confirmation' step. The left pane lists steps: Credentials, Role Services, Setup Type, CA Type, Private Key, Cryptography, CA Name, Validity Period, Certificate Database, and **Confirmation**. The main pane is titled 'Confirmation' and contains a message: 'To configure the following roles, role services, or features, click Configure.' Below this is a section 'Active Directory Certificate Services' with a tree view. The tree view shows 'Certification Authority' expanded, with sub-items: 'CA Type' (Enterprise Root), 'Cryptographic provider' (RSA#Microsoft Software Key Storage Provider), 'Hash Algorithm' (SHA1), 'Key Length' (2048), 'Allow Administrator Interactions' (Disabled), 'Certificate Validity Period' (7/29/2020 12:25:00 PM), 'Distinguished Name' (CN=microsoft-SYS1-CA,DC=microsoft,DC=com), 'Certificate Database Location' (C:\Windows\system32\CertLog), and 'Certificate Database Log Location' (C:\Windows\system32\CertLog). Below the tree view are sections for 'Certification Authority Web Enrollment' and 'Online Responder'. The right pane shows 'DESTINATION SERVER' as 'SYS1.microsoft.com'. Navigation buttons at the bottom are '< Previous', 'Next >', 'Configure', and 'Cancel'.



25. Click **Close**

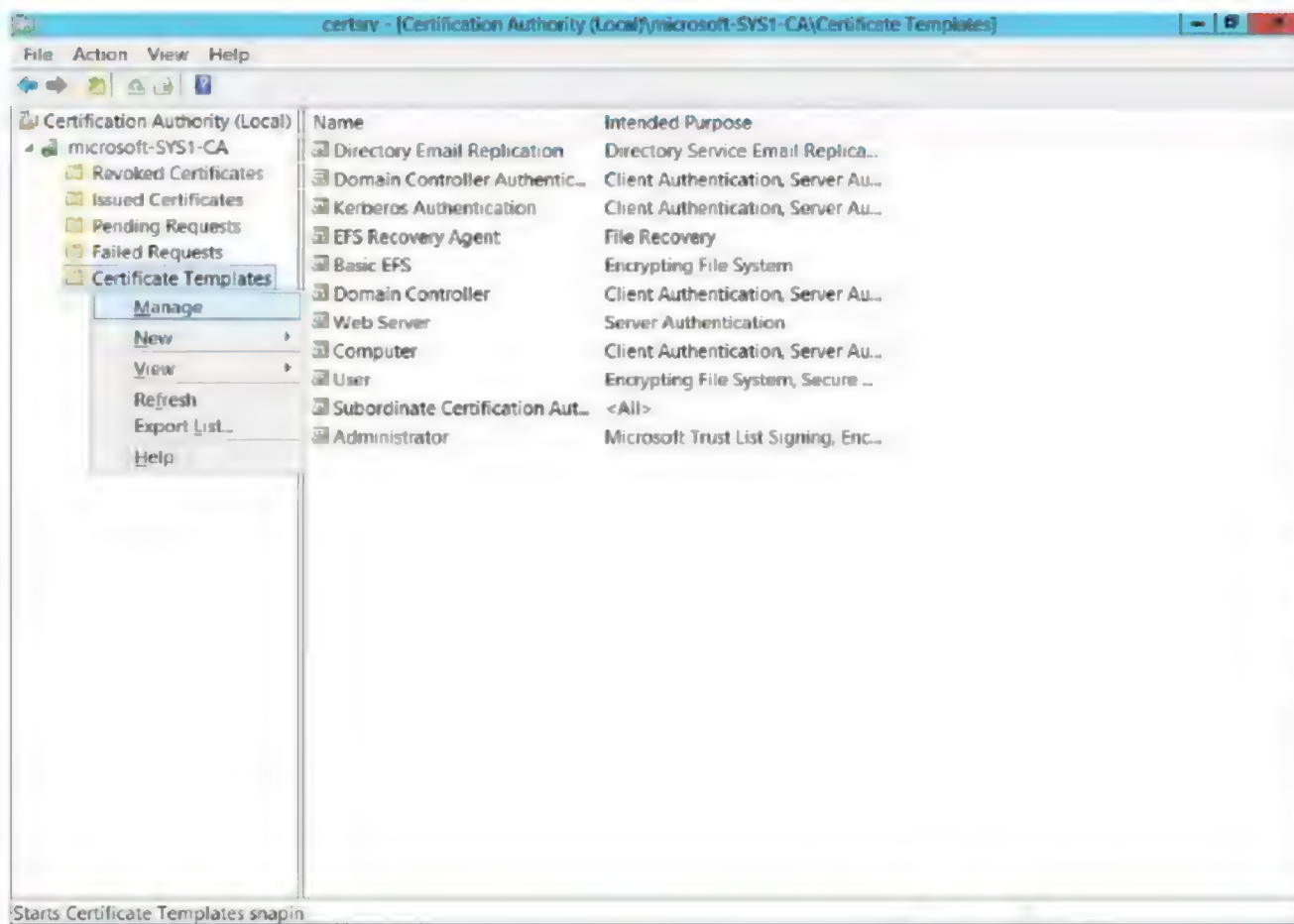


26. Click **No**

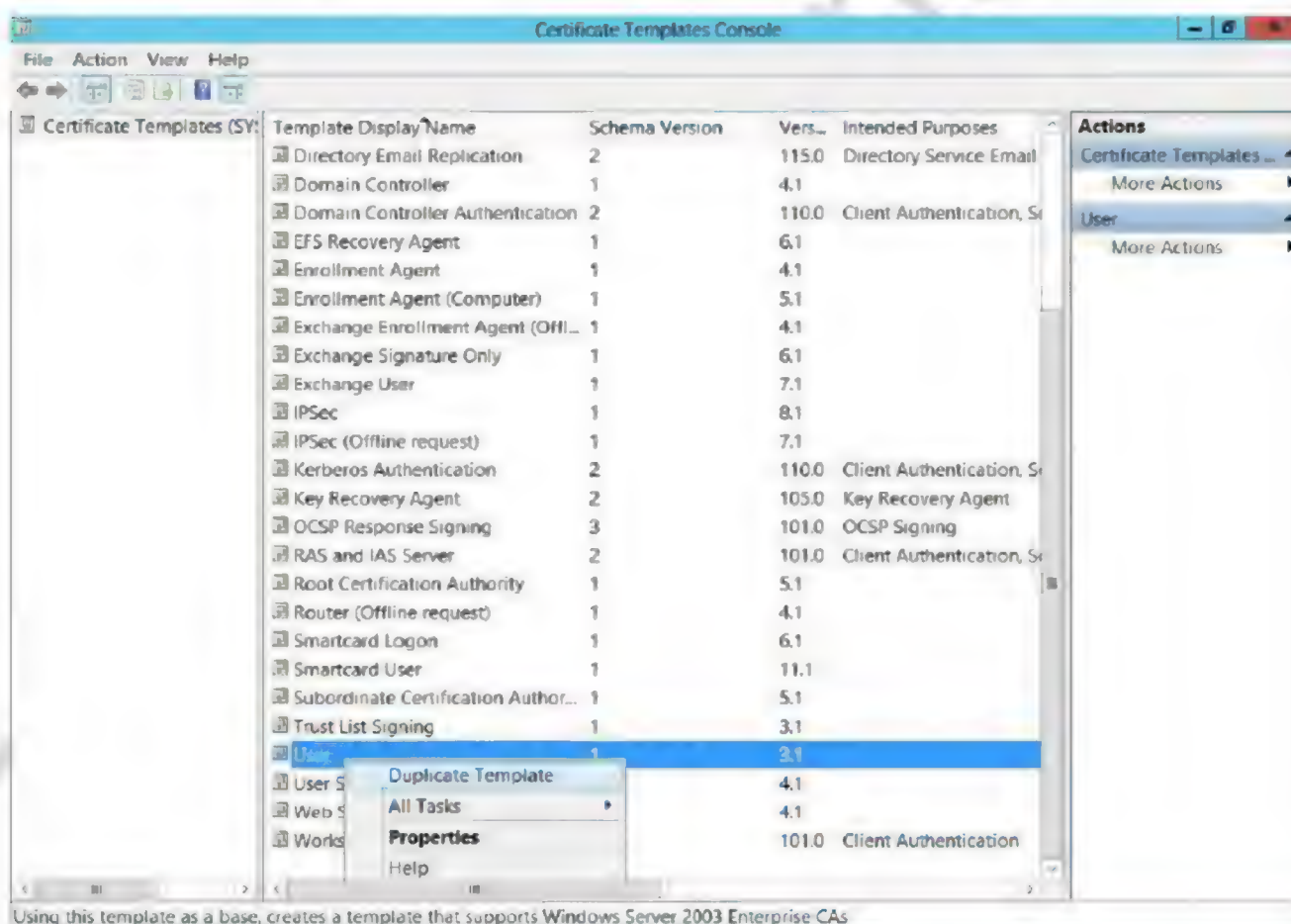
27. Click **Start** → click **Certification Authority**



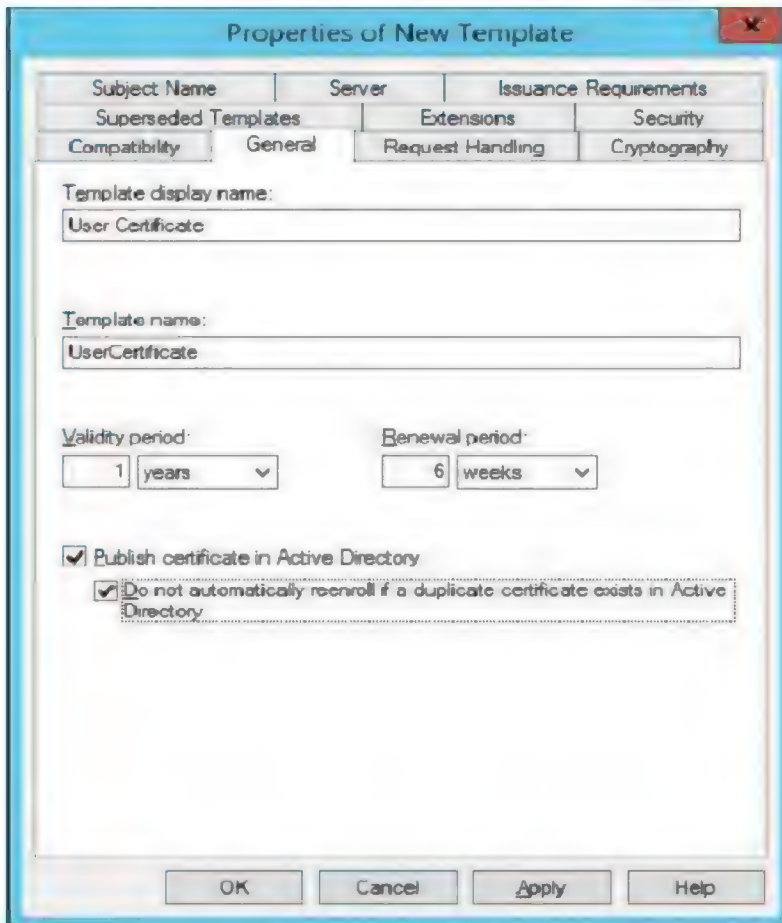
28. Expand Domain (Ex:Microsoft-SYS1-CA)→right click on **Certificate Templates**→click **Manage**



29. Right click on **User**→click **Duplicate Template**



30. Click **General**→Enter **template display name** (Ex: User Certificate)→check the box **Do not automatically reenroll if a duplicate certificate exists in Active Directory**.



Properties of New Template

Subject Name | Server | Issuance Requirements  
Superseded Templates | Extensions | Security  
Compatibility | General | Request Handling | Cryptography

Template display name:  
User Certificate

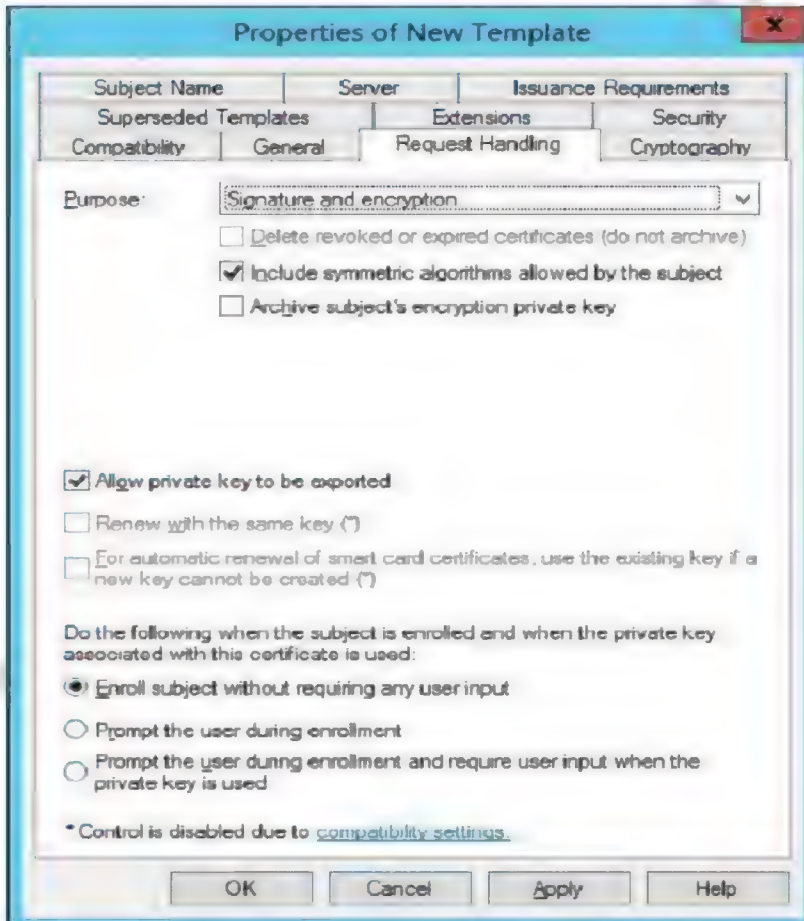
Template name:  
UserCertificate

Validity period: 1 years  
Renewal period: 6 weeks

☒ Publish certificate in Active Directory  
☒ Do not automatically reenroll if a duplicate certificate exists in Active Directory

OK Cancel Apply Help

31. Click **Request Handling**→Expand **Purpose**→Select **Signature and Encryption**



Properties of New Template

Subject Name | Server | Issuance Requirements  
Superseded Templates | Extensions | Security  
Compatibility | General | Request Handling | Cryptography

Purpose: Signature and encryption

☐ Delete revoked or expired certificates (do not archive)  
☒ Include symmetric algorithms allowed by the subject  
☐ Archive subject's encryption private key

☒ Allow private key to be exported  
☐ Renew with the same key (\*)  
☐ For automatic renewal of smart card certificates, use the existing key if a new key cannot be created (\*)

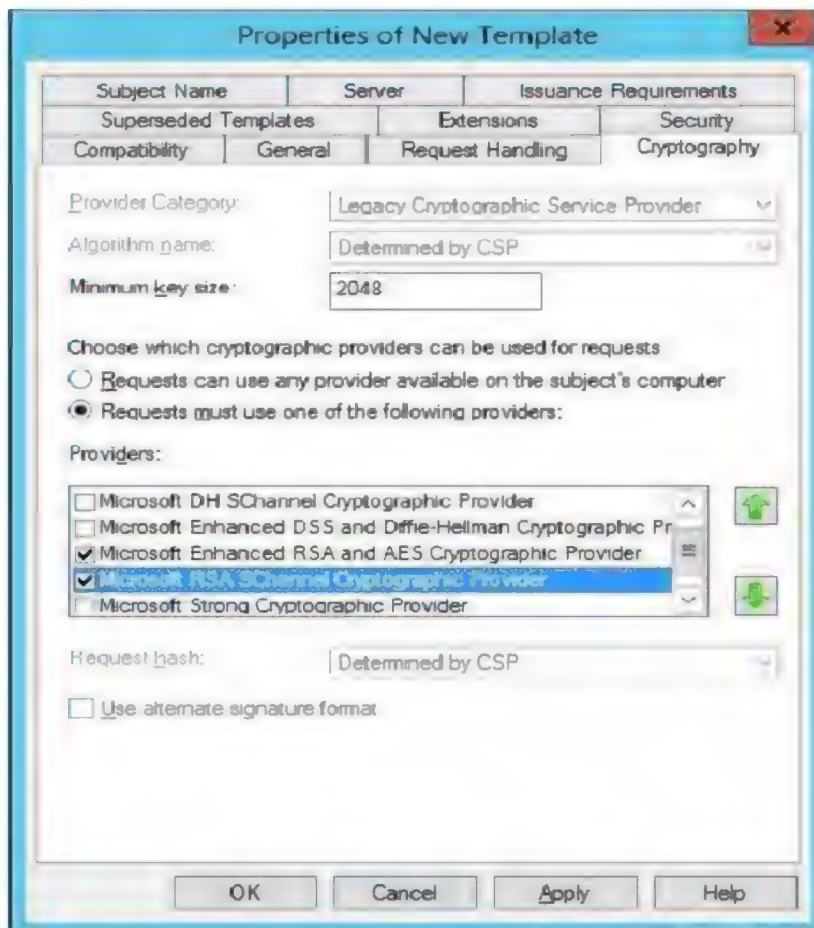
Do the following when the subject is enrolled and when the private key associated with this certificate is used:  
☒ Enroll subject without requiring any user input  
☐ Prompt the user during enrollment  
☐ Prompt the user during enrollment and require user input when the private key is used

\* Control is disabled due to compatibility settings.

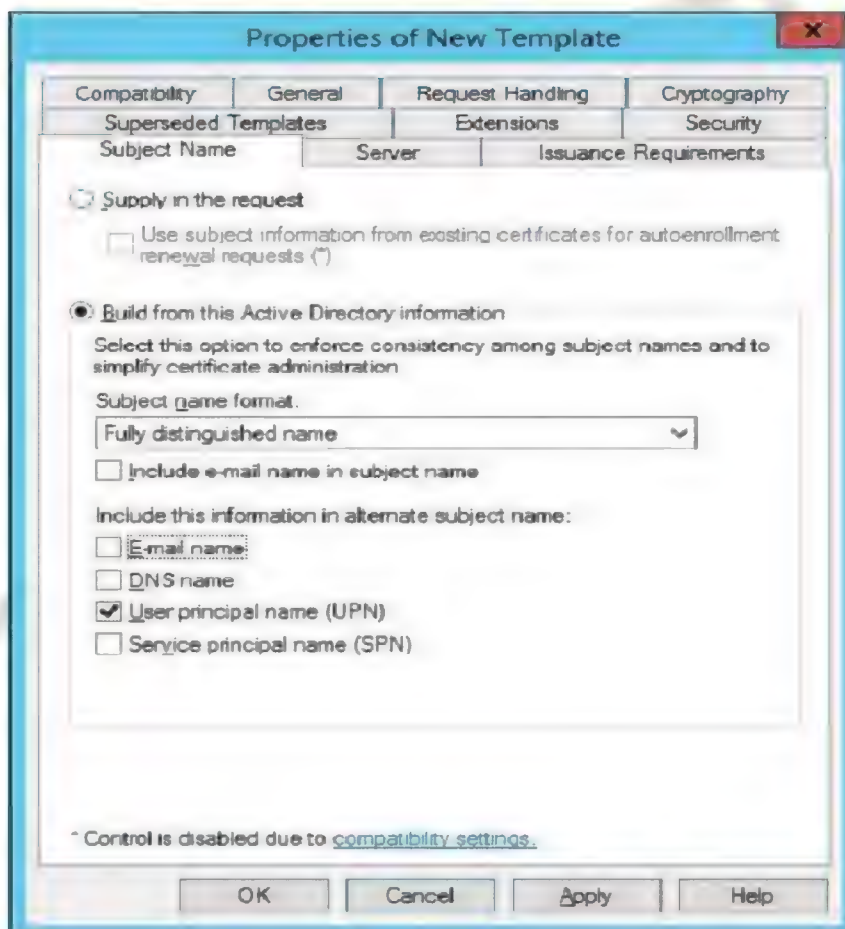
OK Cancel Apply Help



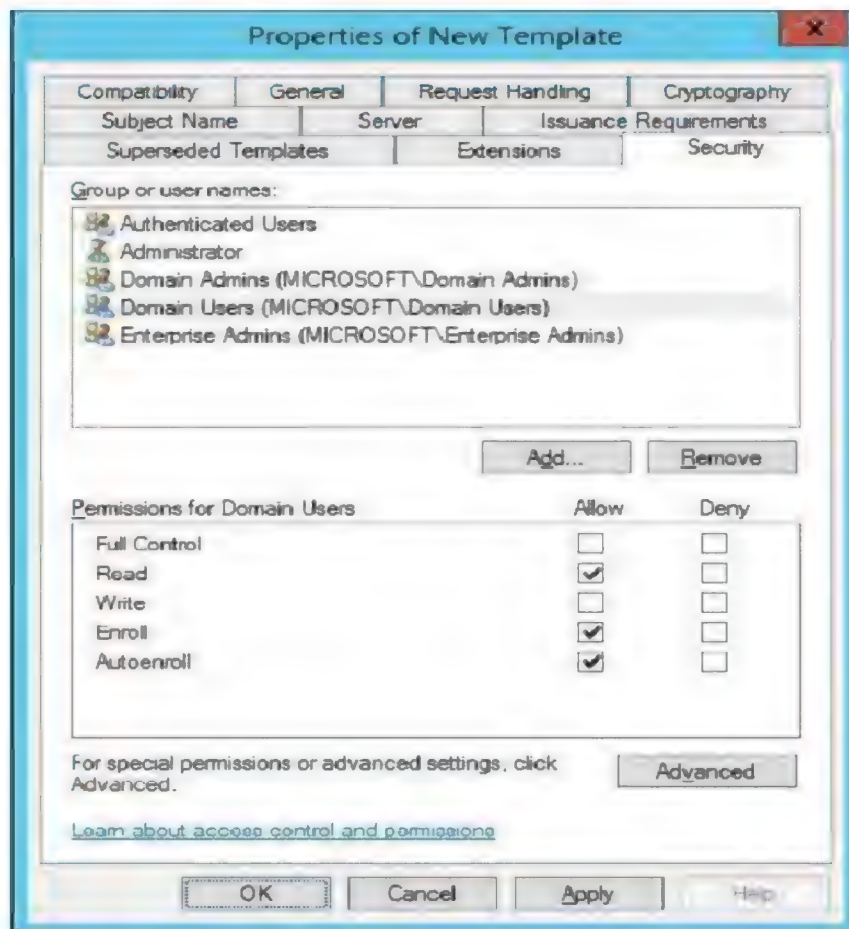
32. Click **Cryptography**→check the box **Microsoft Enhanced Cryptographic Provider v 1.0, Microsoft Enhanced RSA and AES Cryptographic Provider & Microsoft RSA SChannel Cryptographic Provider**



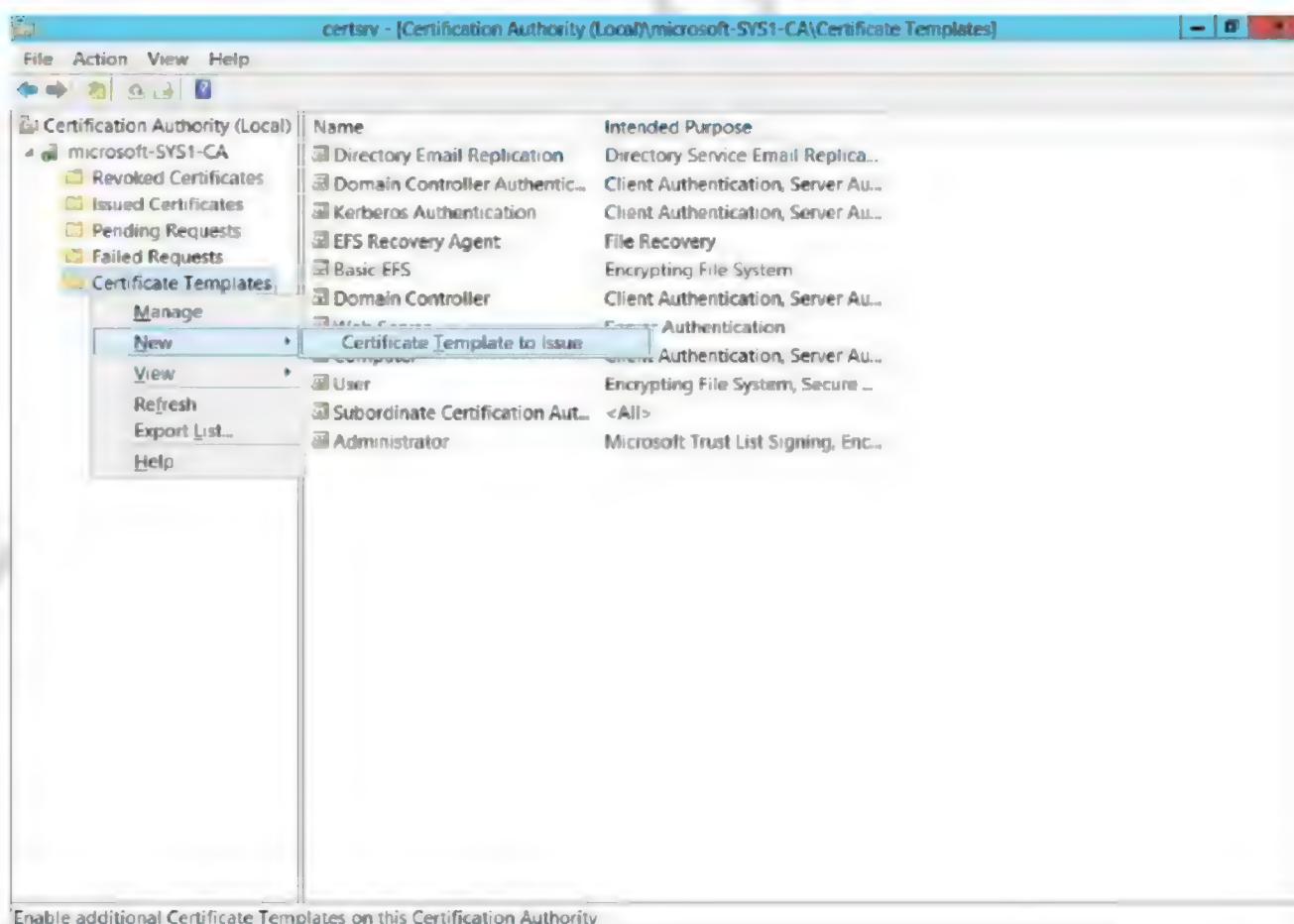
33. Click **Subject Name**→check the box **Email Name**



34. Click **Security**→select **Domain Users**→check the box **Read, Enroll & Autoenroll**→click **Apply**→click **Ok**

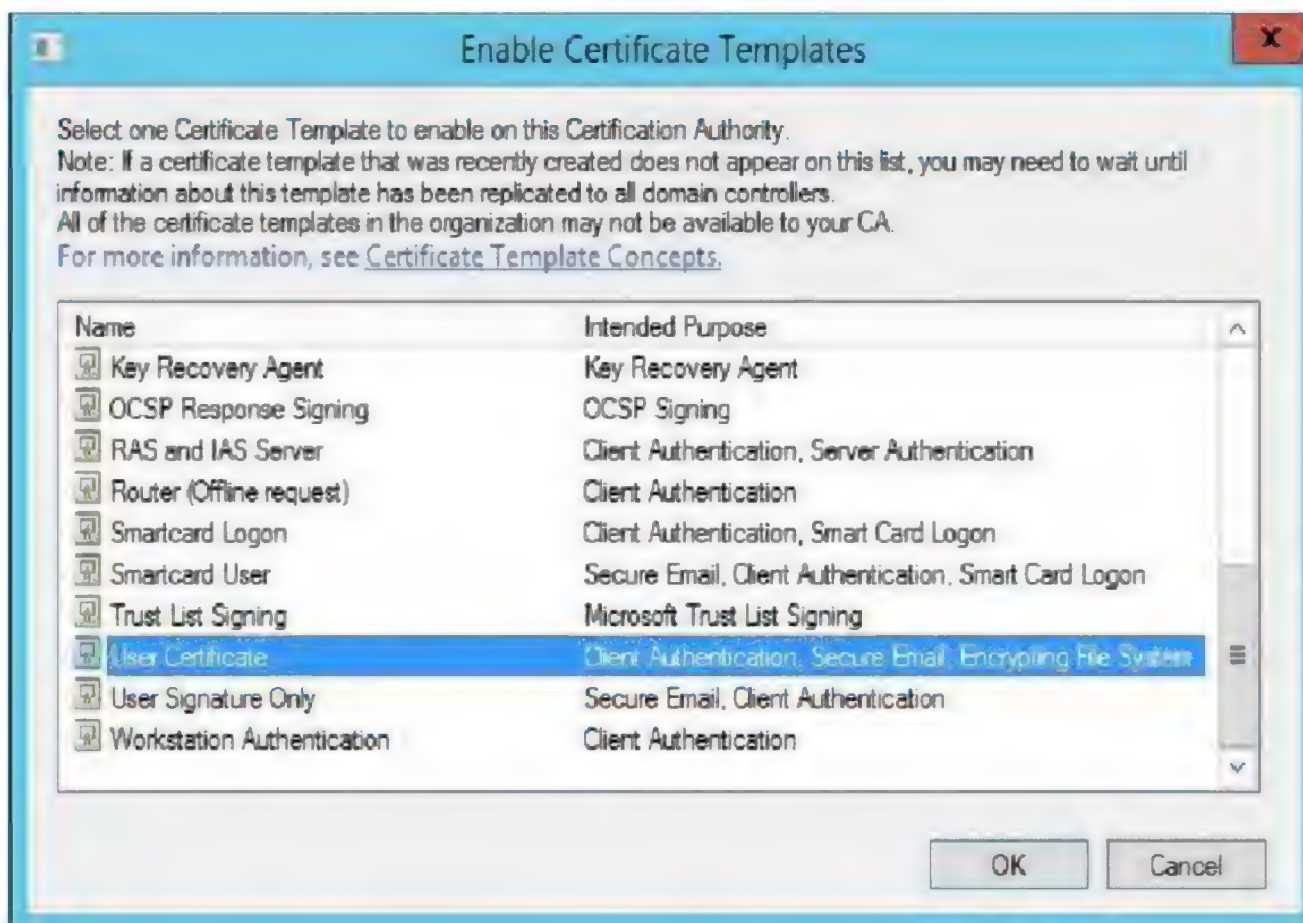


35. Right click on **Certificate Templates**→click **New**→click **Certificate Template to Issue**

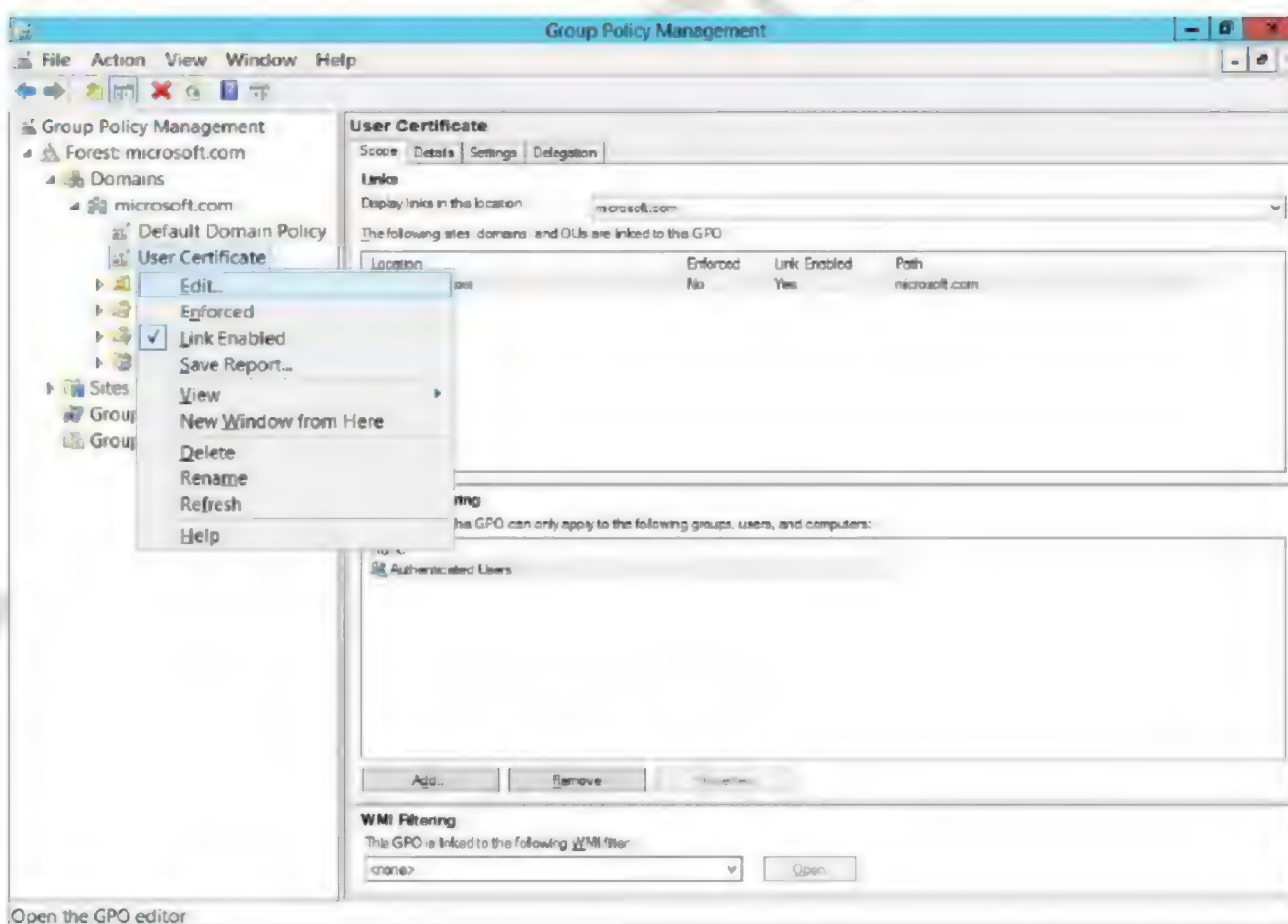




36. Select User Certificate→click Ok

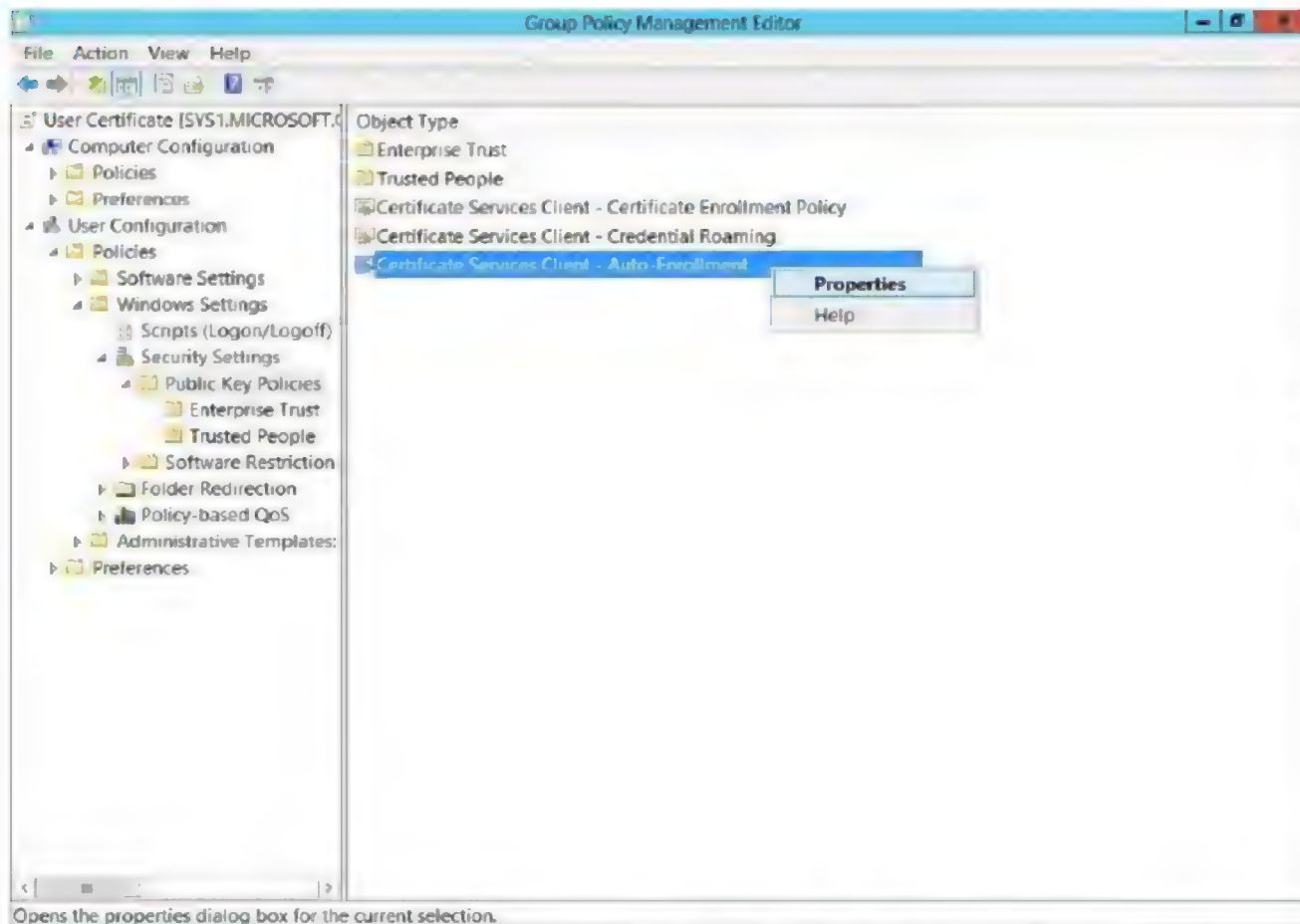


37. Go to **Group Policy**→expand **Forest**→expand **Domains**→right click on **Domain Name (Ex:Microsoft.com)**→create a **GPO (Ex:User Certificate)**→right click on **GPO (Ex:User Certificate)**→click **Edit**

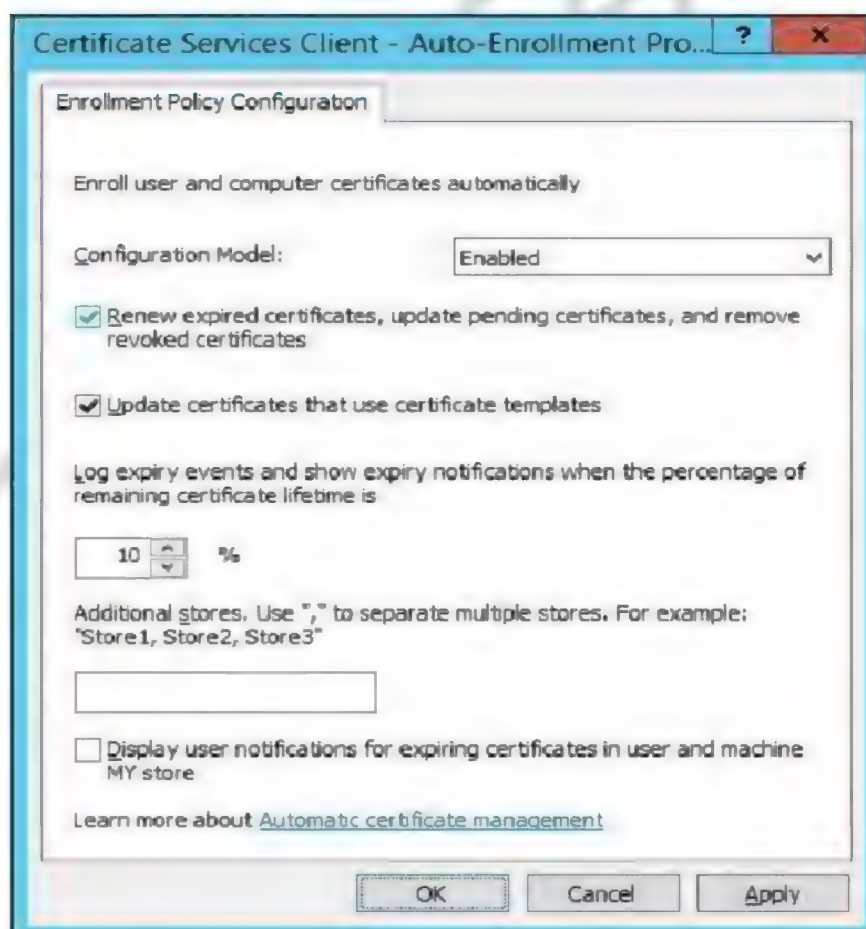




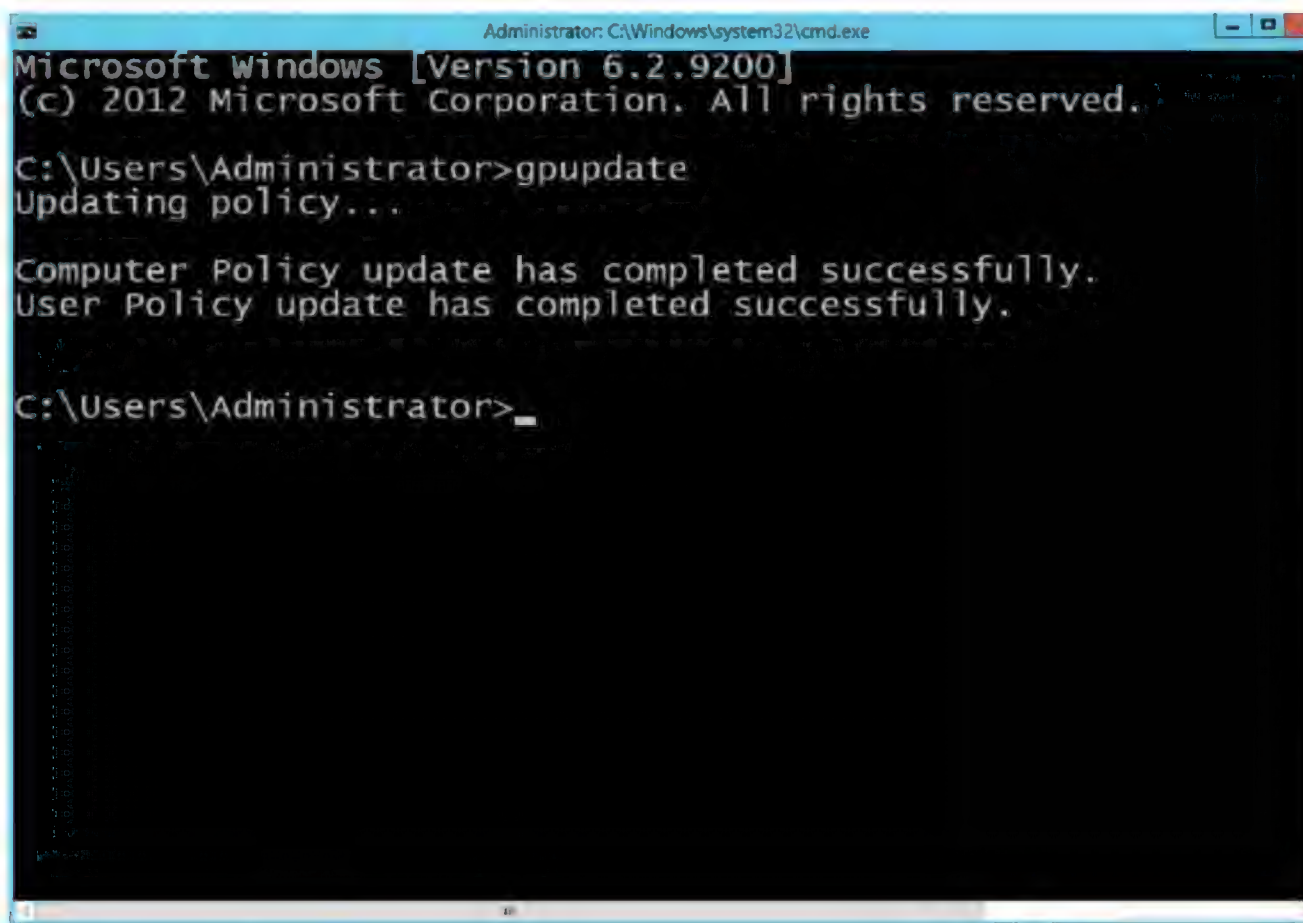
38. Expand **User Configuration**→expand **Policies**→expand **Windows Settings**→expand **Security Settings**→select **Public Key Policies**→right click on **Certificate Services Client-Auto Enrollment**→click **Properties**



39. Expand **Configuration Model**→click **Enabled**→check the box **Renew expired certificates**→check the box **Update certificates that use certificate templates**→click **Apply**→click **Ok**



40. Open **Command Prompt**→type **gpupdate**



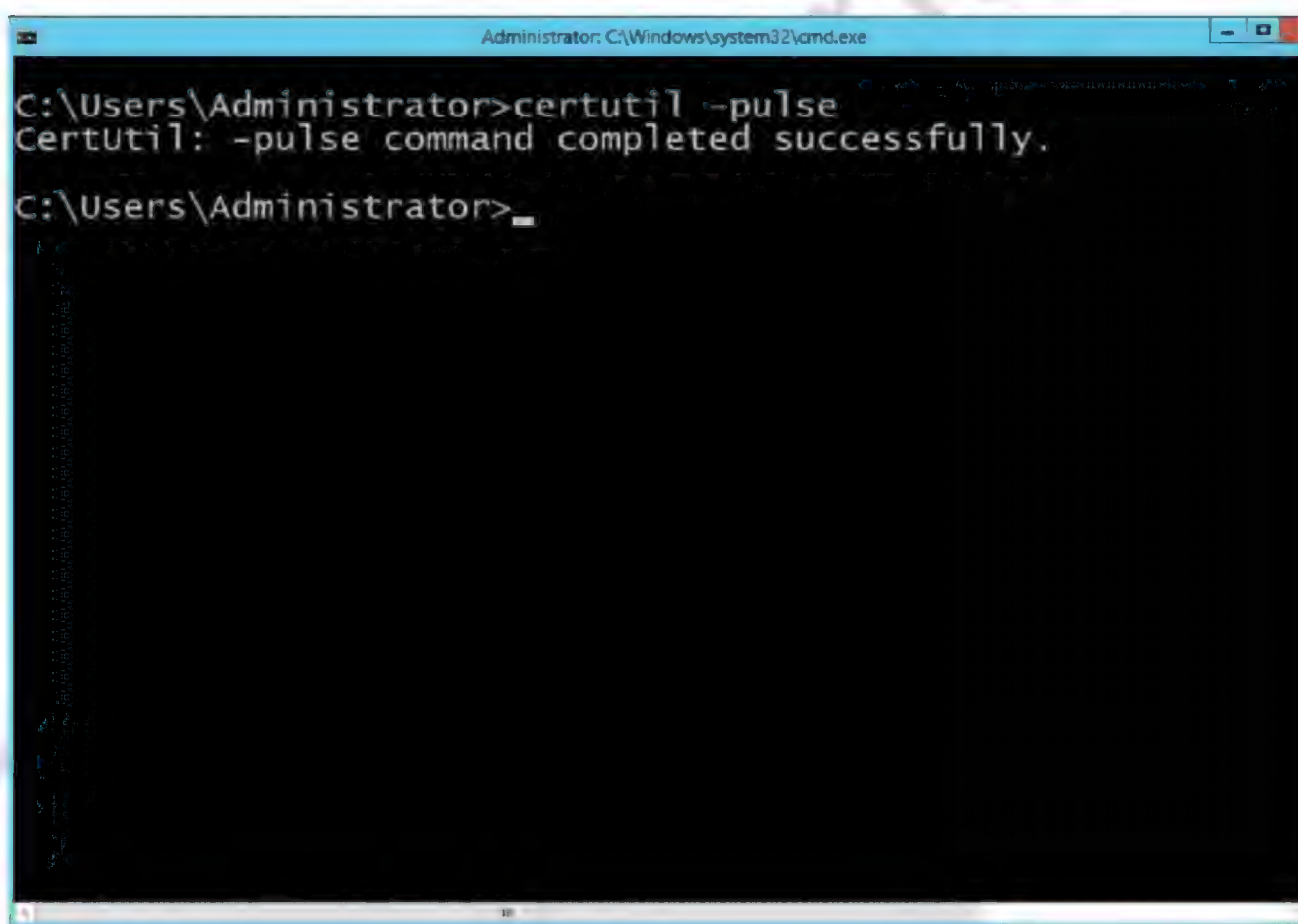
```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>gpupdate
Updating policy...

Computer Policy update has completed successfully.
User Policy update has completed successfully.

C:\Users\Administrator>
```

41. In **Command Prompt**→type **certutil -pulse**

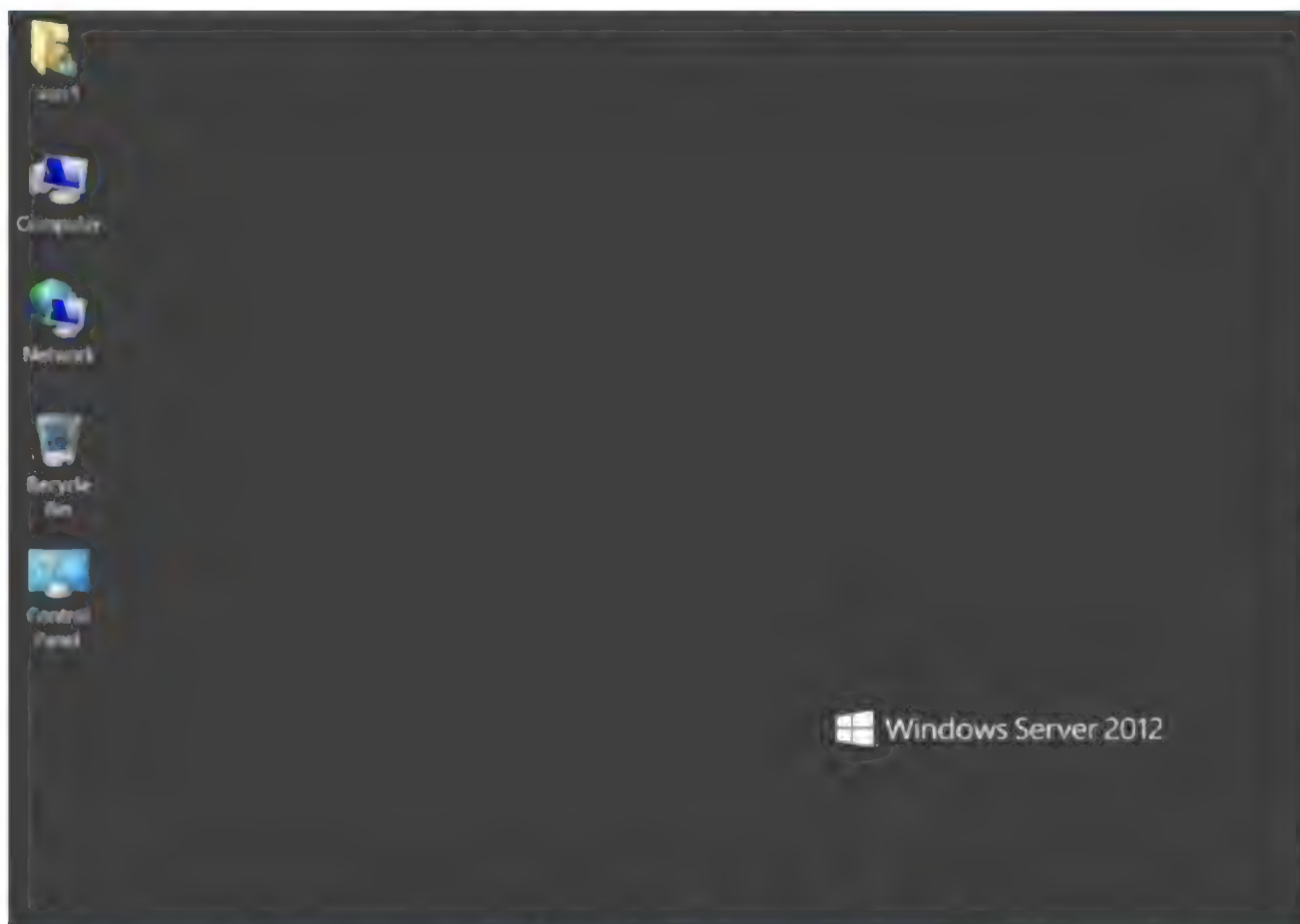


```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>certutil -pulse
Certutil: -pulse command completed successfully.

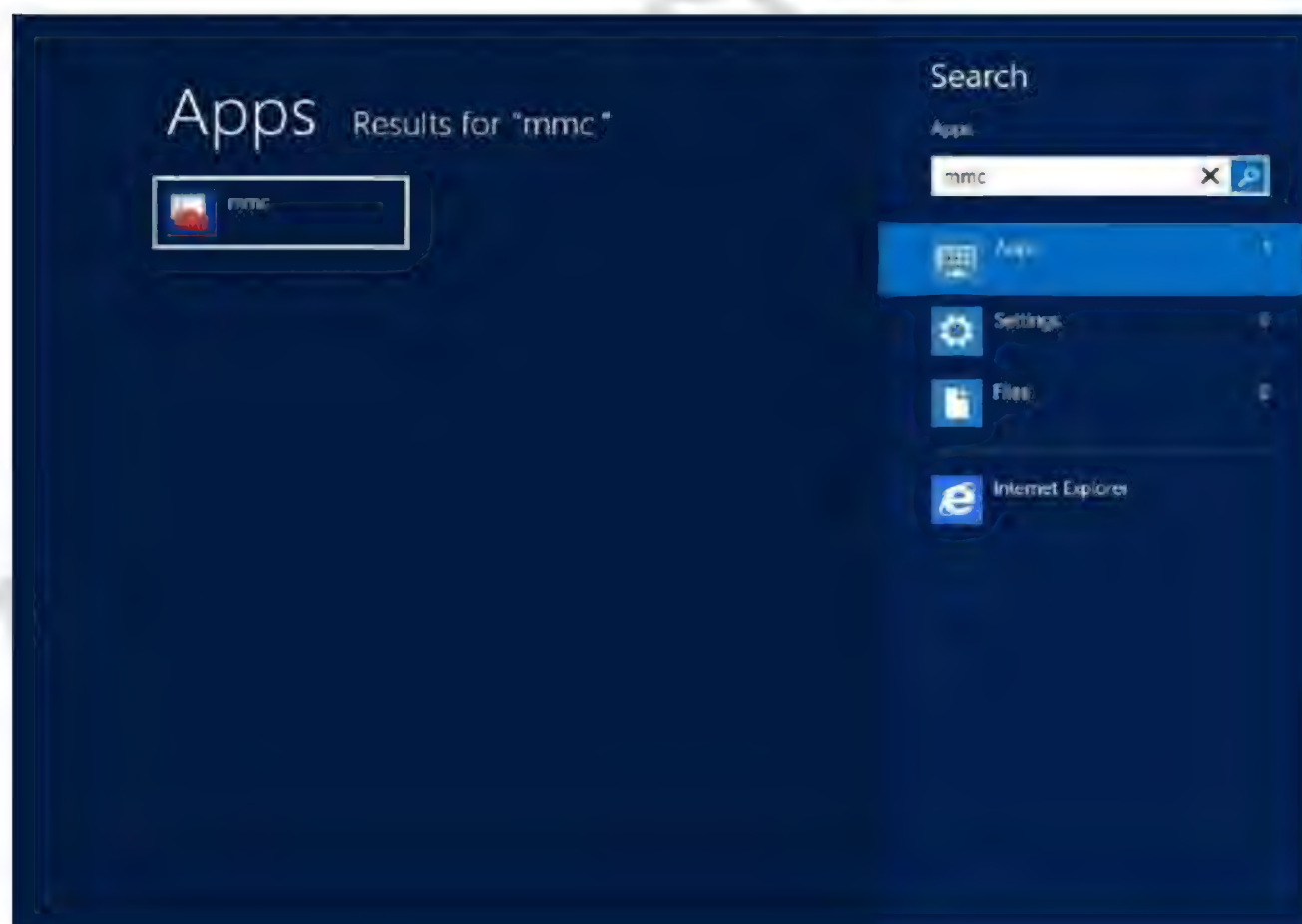
C:\Users\Administrator>
```

**Verification:**

1. Logon to **Member Server** as User (**EX:User1**)

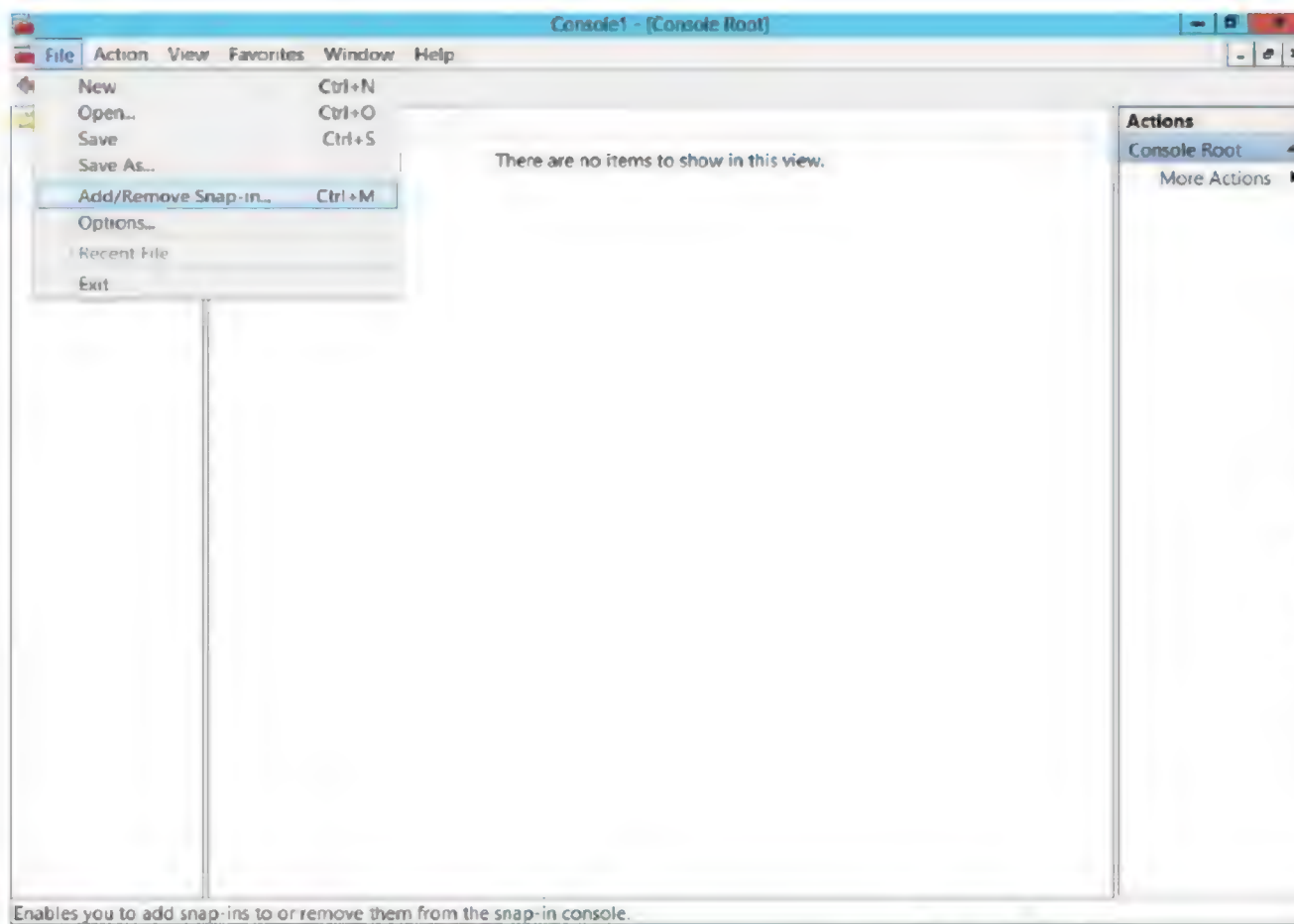


2. Go to **MMCConsole**

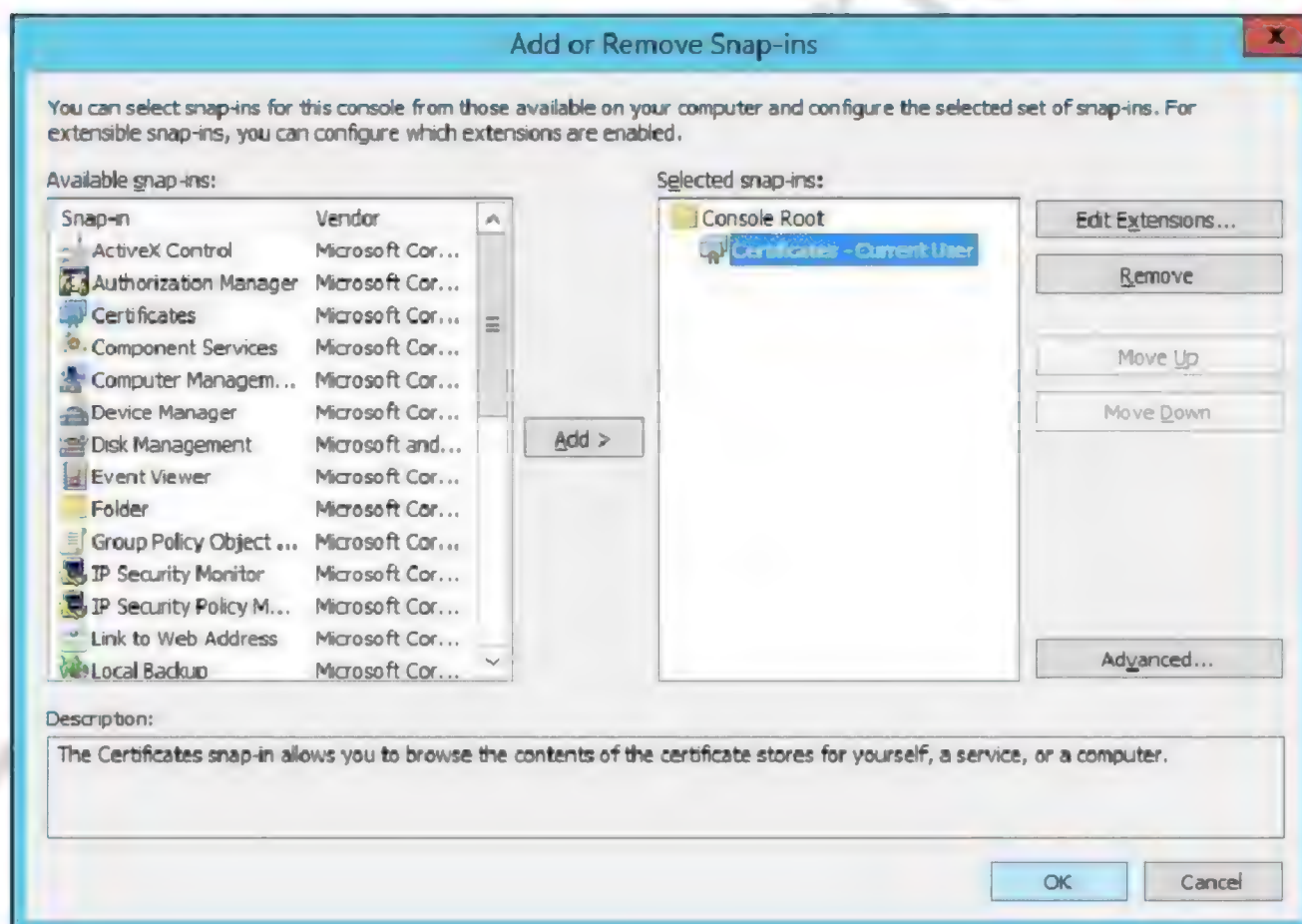




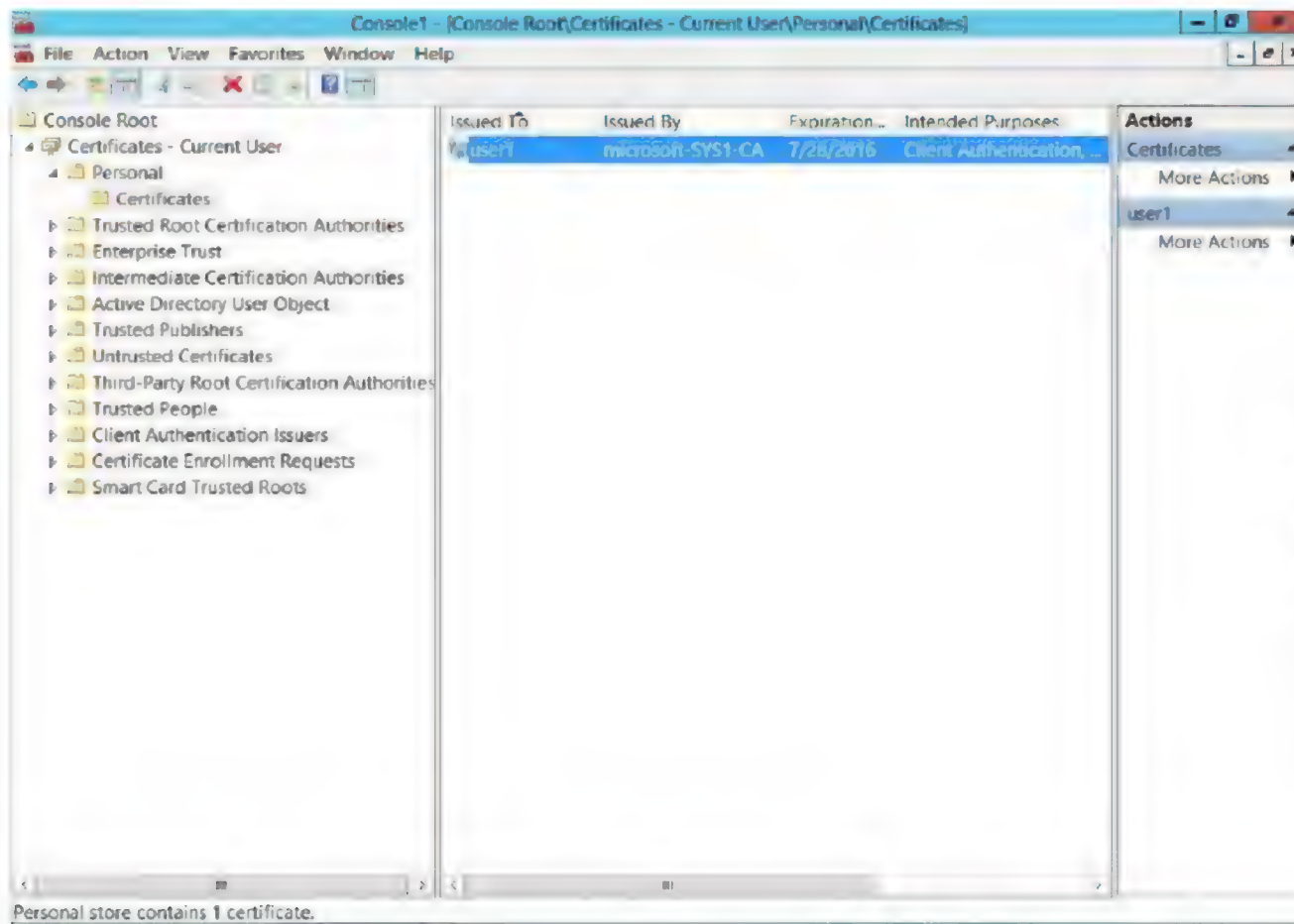
3. Click **File**→click **Add/Remove Snap**



4. Select **Certificates**→select **Certificates-CurrentUser**→click **Ok**



5. Expand **Certificates**→expand **Personal**→select **Certificates** & verify the certificate issued to **User1**



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(Pre requisite is CCNA R&S)

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(Pre requisite is CCNA Security at ZOOM)

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**Fees: ₹ 9,500/-**

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## CCIE SECURITY

(Pre requisite is CCNA & CCNP Security at ZOOM)

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